

# PACIFIC RADIO NEWS

*Pioneer Journal of  
Western Radio News and Development.*

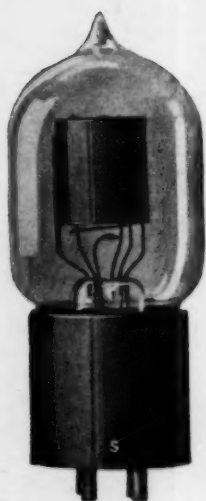
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In addition to national distribution of A-P tubes, manufactured by Moorhead Laboratories, Inc., the ATLANTIC-PACIFIC RADIO SUPPLIES CO. has recently secured exclusive Pacific Coast distribution of the following firms and lines:

DeForest Radio Tel. & Tel. Co.—DeForest C.W. Transmitting and Receiving Equipment, Diamond State Fibre Co.—Condensite Celoron, Shaw Insulator Co.—Molded Radio Supplies, Redmanol Chemical Products Co., Acid and Heat-Proof Insulating Varnishes and Lacquers.

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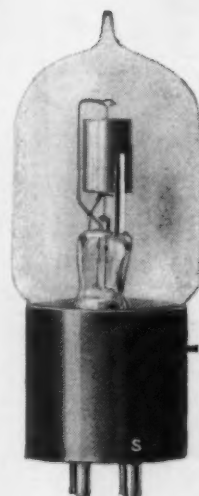
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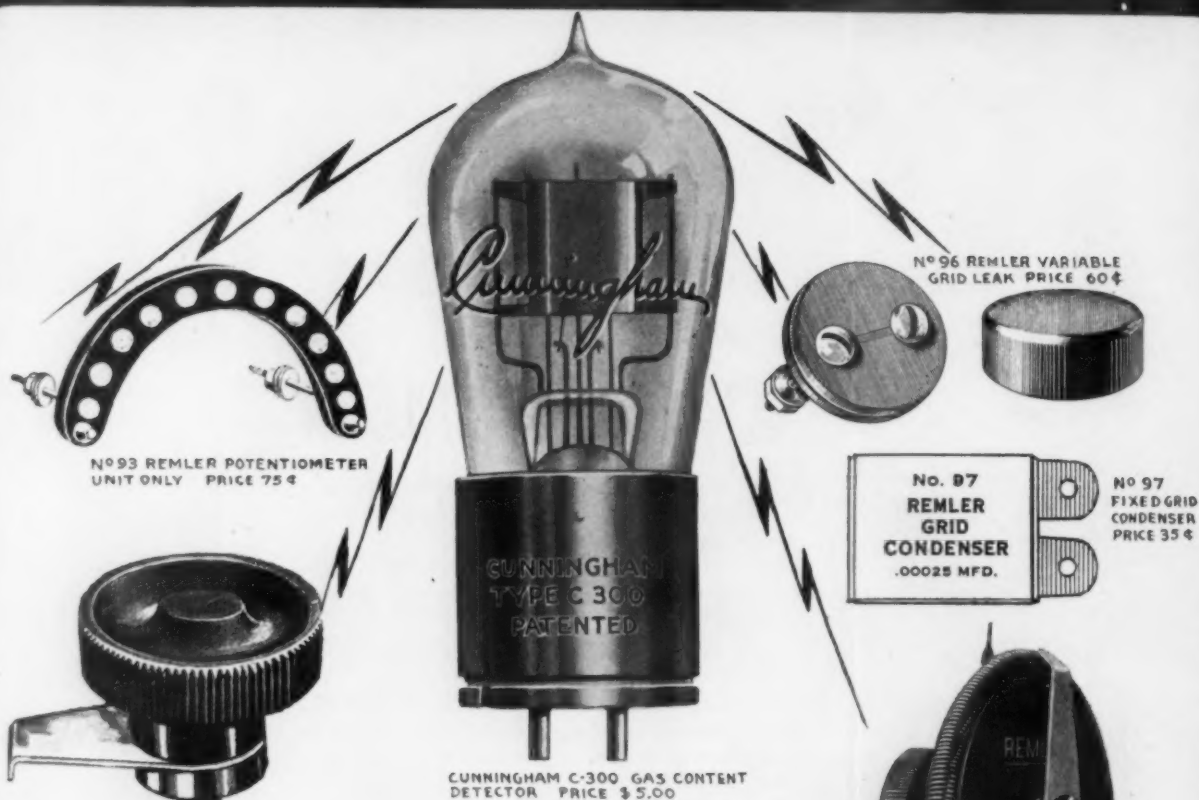
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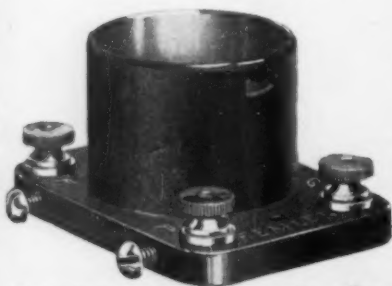
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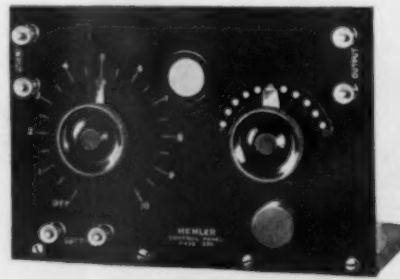
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THESE NEW FIRCO RADIO INSTRUMENTS are typical of the quality of apparatus which we have been supplying to the Government departments for many years—yet the prices are unusually low.

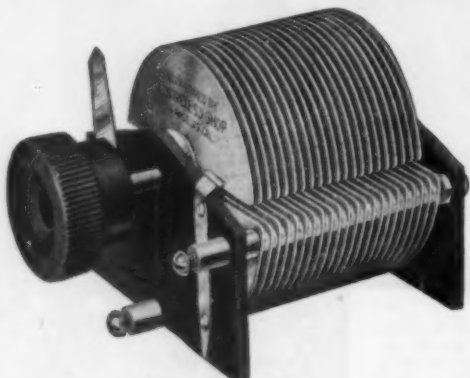
And remember, only a few of the instruments are illustrated here.

**John Firth.**

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# QUALITY OR PRICE?

Which are You interested in?



SERIES "T"

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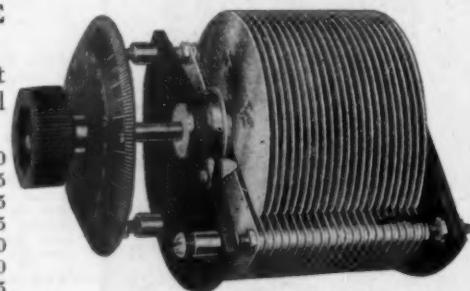
BEST of material and workmanship—

Careful inspection, and NO COMEBACKS. ISN'T THAT WORTH SOMETHING?

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No. 70	7 plate, approximately .0001 m. f. maximum capacity.....	2.35
No. 130	13 plate, approximately .0002 m. f. maximum capacity.....	2.75
No. 170	17 plate, approximately .0003 m. f. maximum capacity.....	3.15
No. 230	23 plate, approximately .0005 m. f. maximum capacity.....	3.60
No. 310	31 plate, approximately .0007 m. f. maximum capacity.....	4.30
No. 430	43 plate, approximately .001 m. f. maximum capacity.....	5.25
No. 630	63 plate, approximately .0015 m. f. maximum capacity.....	7.50



SERIES "L"

IF YOU REQUIRE A HEAVIER MODEL THAN THE "SERIES T"—OUR "SERIES L" WILL FILL THE BILL. Larger plates and heavier construction throughout. Supplied with knob and pointer and mounting screws, brass or nickel.

### PRICES

No. 2300	23 plate, approximately .00075 m. f. maximum capacity.....	\$ 6.00
No. 4300	43 plate, approximately .0013 m. f. maximum capacity.....	8.00
No. 6300	63 plate, approximately .002 m. f. maximum capacity.....	10.00

Include postage for two pounds on No. 2300 condenser and for three pounds on No. 4300 and No. 6300, and insurance, to your postal zone.

AND—OUR SERIES "CW" IS THE ONLY REAL CONDENSER FOR YOUR PHONE OR "CW" SET.

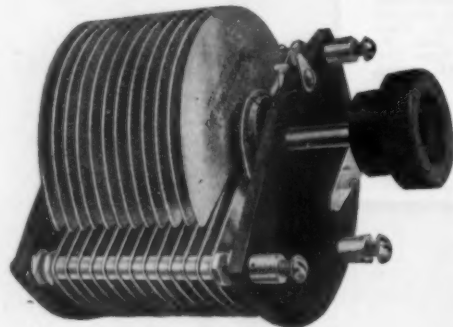
The plates are amply spaced to prevent spark-over on high plate potentials, and the construction is extremely rigid. With knob and pointer and mounting screws, the prices are:

### SERIES "CW"

No. 1500	15 plate, approximately .0004 m. f. maximum capacity.....	\$6.00
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Include postage for two pounds on No. 1500 condenser, and for three pounds on No. 2500 and 3500, and insurance, to your postal zone.

IMPORTANT ANNOUNCEMENT—Watch our ad. next month announcing our new VERNIER, which may be attached to any standard "Wireless Shop" Variable. And the price is so low it will surprise you. See it next month.



SERIES "CW"

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LOS ANGELES, CAL.



**ARTHUR H. HALLORAN**  
Editor

**LAWRENCE MOTT**  
Assoc. Editor

**H. W. DICKOW**  
Business Manager

151 Minna Street,  
San Francisco, Cal.

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# PACIFIC RADIO NEWS

## RADIOTORIAL

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## Wherein the New Editor Introduces Himself

**A**T his first appearance before the reading public he is to serve, an editor is expected to drop the mantle of his multiple personality so as to draw a pen picture of himself and to outline his editorial policy. Thereafter "never again" on the tall, vertical pronoun.

So I, Arthur H. Halloran, being duly sworn, do depose and say that I am a Westerner by birth, an engineer by profession, a publisher by vocation and a radio enthusiast by avocation. As a boy I learned to set type, was editor of two amateur papers, and was manager and editor in turn of an engineering magazine at the University of California. Then I was with the Mining and Scientific Press for three years as associate editor and as advertising manager, with the Journal of Electricity for ten years as managing editor and have just ceased to act as Pacific Coast representative of the McGraw-Hill Book Co. I am young enough to play with my own two boys and old enough to enjoy a heavy reputation as a scientific high-brow. Furthermore, I have been actively identified with several electrical associations.

My intention as editor is to carry on the good work that has already been started in these columns, with the hope of making each issue bigger, better, and brighter than the one before. New features and new departments are to be added. The needs of the beginner, as well as those of the more advanced worker, are ever to be kept in mind. The enlarged scope of the paper will be made evident by the new name RADIO, which will greet you on the cover of the next issue. Yet all of the old features that have endeared P. R. N. to the hearts of its readers will be retained. Especial attention is to be paid to C.W. work under the direction of Mr. Lawrence Mott, who will continue his writings as associate editor.

You and I are young in the world of radio, which opens up a vast new continent for discovery and development. Radio communication is making the



Arthur H. Halloran,  
Editor of "Pacific Radio  
News"

world, and mayhap the universe, smaller. Maxim predicts wireless transmission of power. Marconi believes that he has intercepted messages from Mars. The man who says that something is impossible is interrupted by some one doing it. Every day witnesses new applications of the hitherto dark octaves of etherial vibrations. Yesterday's dreams are today's experiments and tomorrow's actualities. There is always something new and interesting to learn in radio, and it is my function as editor to help you in so doing.

But this can be done satisfactorily only by your letting me know what kind of articles you would like to read and by your submitting news about your work for publication. When you solve some knotty problem, when you hear some interesting bits of news, or when you learn of something that will help your fellow worker in the radio field, send it along so that it may be printed. "Your light is none the less for having lit that of your neighbor"; your magnet is none the weaker for having magnetized his; your radiations are none the less powerful for being picked up by some distant amateur.

Also let me know what is your big problem, what there is about radio that you do not understand, and what kind of articles you prefer to read. Your criticism or praise, your questions or needs, will be my guide in trying to give you the kind of a paper you want to read. An editor is not a mind-reader but must depend upon constant expressions of opinion from his readers in order to help them and hold their interest. It is really the readers that make a paper. You can help to make RADIO the foremost paper in its field. The more you help the better you will be served.

Therefore let it be our slogan—yours and mine—  
"All together, all the time, for everything in radio."

ARTHUR H. HALLORAN.

(Radiotorial Continued on Next Page.)

## RADIO PATRIOTISM AND PREPAREDNESS

By Lawrence Mott, Associate Editor

**I**T was the immortal Theodore Roosevelt who cried: "Preparedness" from the housetops! And yet no American that ever lived desired peace with greater intentness than did President Roosevelt. But he was thoroughly aware of the fact—since, adequately proven!—that "Peace" is as yet by no means universal in the hearts of mankind. I remember one of his favorite maxims: "It is a good lesson for nations and individuals to learn, never to hit if it can be helped, and never to hit soft!"

Under the Harding administration many strides forward have been taken, and are being taken, for the well-being and safety of the nation, and the War Department, recognizing the potential value of the cordial and sympathetic co-operation of amateur radio energy, has decided to undertake a carefully-laid plan to further encourage amateurs in their radio efforts, and at the same time to lay the foundations for a most useful—and very large—body of men, should occasion ever arise for their need.

Through the courtesy of The Signal Officer, Ninth Corps Area, stationed at San Francisco, I have been supplied with as much data as is—so far—available—and that deals with the formation, in November, of a force to be officially known as "Organized Reserves"—of which The Signal Corps, Reserve, will be one branch. Members of this Corps will be taken from the amateur rank and file, according to certain qualifications and gradings—to be formally announced at a later date.

Ere I proceed to give a brief resume of the intents of the War Department along these lines, I would earnestly point out to all amateurs that this is an opportunity—not only to advance their own radio education, vastly—but an opportunity of great strategic value, of vast importance, and one that no red-blooded American amateur radio operator—boy or man!—should heedlessly pass by! To me, the greatest sin of them all is: **lack of patriotism!** In other words—the spirit that permits Bill to go out and fight!

The story—writ' large in the Hall of Eternal Records—telling of American deeds on European fields of battle must ever be an incentive to us who follow after! An incentive to emulate, that must NOT be allowed to become tarnished by Time and dulled by Forgetfulness!

Now then: (quoting from official information):

"Congress has authorized the organization of a branch of the Army of the United States, to be known as the 'Organized Reserves'. Training will be given members, subject to the availability of appropriations, by attendance at camp for a period probably not to exceed two weeks each year, all clothing, equipment, and subsistence to be furnished by the United States for the purpose and period of training, and the regulations provide that each member of the Reserve Corps reporting at camp will receive five cents per mile travel allowance.

"The mobilization of the members of the enlisted Reserve Corps is effected through mobilization of the organizations to which they are assigned or attached. Orders directing mobilization will be transmitted through the usual channels. If a certain Signal Corps Unit were ordered out for two weeks' training, members of the unit would be notified, and—according to existing regulations—would be given 60 days in which to prepare for leave of absence from their usual duties.

"In order to have the most successful period of training, members of the radio company should be as nearly radio operators as possible, before going to camp. Training before going to camp is, therefore, **essential**. This is important, also, in that were an **emergency to develop**, these men would be ready immediately upon mobilization to give our Army the very best, quickest and most available communication possible—by radio telegraphy.

"There are apparently two methods of procedure: **First**—to fill up the organization with amateurs who are well ad-

vanced in radio, and who may be used as a nucleus for the organization of a Corps radio net, purposed to give instruction in radio telegraphy, and which would begin functioning immediately the organization is completed. **Second**—to secure as the balance, those amateurs whose education can be advanced by such code training and other instruction as the Signal Corps is able to provide, by using the means at hand—particularly the new stations under construction—and by correspondence instruction.

"As to those of the first class mentioned: There is little that can actually be done for them in instruction, except perhaps high speed code training and the development of their knowledge of Signal Corps duties, by distribution of Signal Corps literature and subsequent discussion of same by correspondence. The establishment of the Corps Area amateur reserve net would of course include the stations now controlled and operated by the amateurs of the first class, and control stations could be established which could co-ordinate the practice traffic. In addition, it is thought entirely practicable to grant permission to any amateurs, members of the Reserve Corps to visit any of the Signal Corps stations and "sit in" under the direction of the operator in charge, and thus secure practice in handling traffic. No practice code or traffic should be handled on a wave or at a time which would interfere with the regular American Radio Relay or other amateur activities.

"The training in code will be a function of the Signal Corps stations now under construction. It is possible that outlying stations, owned and operated by members of the Reserve Corps, would be called upon to relay practice traffic and code, and, if so, the Signal Corps would furnish (if it can be arranged), the relay apparatus. Also, in an emergency the more powerful and better of the amateur stations would certainly be of great assistance to the Army. Relaying is mentioned because we do not know as yet just what results will be secured from the new Signal Corps stations.

"It is hoped that the second class mentioned will be, at first, in the minority. In any event, their education must be undertaken. It is probable that a correspondence course on Signal Corps radio equipment, which would obviously be a course of instruction covering radio in general, and only specializing on Signal Corps radio equipment, would be entirely feasible. In addition, the Signal Corps would attempt to send out code instruction to this class—also, at regular intervals to maintain liaison by correcting code lessons sent in.

"The radio stations under construction in the Ninth Corps Area will be at the Presidio, San Francisco, California; Fort D. A. Russell, Wyoming, near Cheyenne; and at Fort Douglas, Utah, near Salt Lake City. If the tube transmitters work as expected, a daylight range of 1000 miles C. W. transmission should be secured, and at least 300 miles daylight telephone transmission. Several others are being constructed throughout the country and will form the Army radio net of the United States. At such places as the Signal Corps School of Presidio of San Francisco, instruments will be available for the calibration of amateur sets, and every assistance will be given members of the Reserve with a view to the development of their sets and advancement of their education. It is contemplated that at scheduled times, signals will be sent from the Signal Corps stations in this Corps Area on certain definite and standardized wave lengths, which will be of great assistance to operators in the precise calibration of their receiving apparatus.

"The time is not quite ripe for applications to be filed for membership in the Reserves. Complete information regarding this will be published as soon as available.

"If the patriotically inclined young man can only be made to realize that he is a part of the 'big scheme' and that he or his station may be called upon to actually function as an invaluable link in our lines of communication, were a national crisis to arise, it is possible he may give his sincere co-operation to the development of our amateur radio reserve. There is a large quantity of first class, live amateurs, of eligible age, who would surely make up the personnel of a fine organization. It is hoped that we can interest men of good education, so that the organization as a whole will be composed of the very 'top-notchers' of the amateur fraternity."

More words of mine are unnecessary!

The above **MUST** appeal to American youth and manhood! I shall be deeply interested to watch future developments, as my faith in my fellow countrymen is—**unbounded!**

I would suggest that all inquiries for further information be addressed directly to **The Signal Officer, Ninth Corps Area, The Presidio, San Francisco**—and not to me, as I should but have to make inquiry of him—anyway!

**LET'S GO!**



# Construction of a 20-Watt C. W. and Radio Telephone Set

By O. Schuwendt

A COMPACT and efficient four-tube C. W. and radio telephone set built by the writer may be duplicated by any experimenter who will study and apply the directions in this article. The set, as originally designed and built, uses four 5 watt V.T.2 transmitter tubes as oscillators. With a plate voltage of between 350 and 375 volts no difficulty is experienced in obtaining a radiation of between  $\frac{3}{4}$  and 1 ampere, although with Radiotron, Cunningham or A.P. transmitter tubes, which the writer advises the prospective builder to use in the set, a radiation of between  $1\frac{1}{2}$  and 2 amperes should be easily obtained without overloading the tubes.

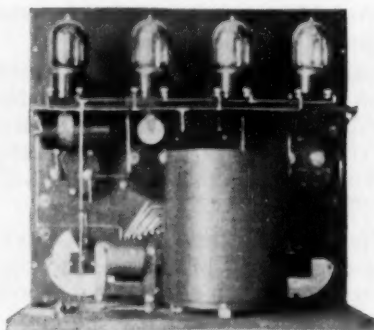


Fig. 1 (Above) Rear view of panel.

Fig. 2 (To Right) General Assembly Drawing.

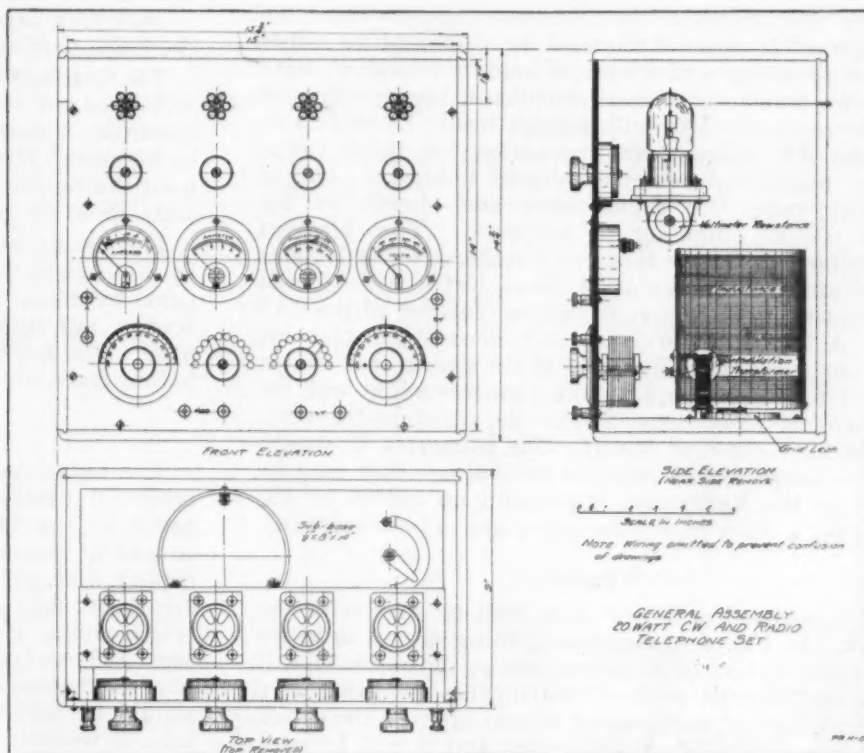
The arrangement of the various pieces of apparatus required in the construction of a highly efficient C.W. transmitter must be compact. Short connecting leads are essential. But compactness must not give way to efficiency. The general arrangement of mounting the apparatus shown on the panel in illustration is an excellent one. Care must be exercised in wiring the transmitter in such a manner that the high tension leads will not interfere with those carrying the low tension current. Nickel plated hard-drawn copper wire is well adapted for the bus-bar type of connections. Rounded corners and firmly soldered connections will not only add to the appearance of the wiring, but will prevent loss from leakage. All connections terminating into binding posts should be soldered. Do not depend on screw-and-nut connections. They will often work loose.

Fig. 1 is a rear view of the panel removed from the cabinet. The builder should note especially the rigid type of bus wiring used, all connections being as straight and direct as possible. Fig. 2 is a general assembly drawing which will help to make clear certain points which cannot be readily seen from the photographs.

Referring to the drawing Fig. 2, the holes at the top of the panel are for observing the brilliancy of the filaments when the tubes are lighted. The rows of knobs, directly below these holes, are the knobs of the rheostats for controlling the filament current of the tubes. The row of meters below the rheostats are, from left to right, hot-wire ammeter, filament ammeter, plate milliammeter and voltmeter. Below these meters are the aerial tuning condenser, wave length switch, plate circuit switch and grid condenser. The two binding posts at the left of the panel are for aerial and ground connections, while those at the right are for connection to the high voltage source. The two lower right hand posts are for filament current, while the two at

the lower left are for the source of modulation and are connected to the primary of the modulation transformer. By connecting either a battery and microphone or a buzzer and battery in series with a key to these posts the set may be used for voice transmission or buzzer modulated telegraphy respectively.

No means is provided in the set proper to change rapidly from one method to the other, but this can easily be taken care of by means of a small single pole double throw switch outside the set. For straight C. W. telegraphy the writer believes that the best method to use is the compensated wave, by placing a key in the ground lead with seven or eight turns of



heavy wire wound in a coil 3 inches in diameter connected across its binding posts. This will make the emitted wave length about 8 meters longer with the key up than when it is depressed, and on 200 meters this is enough difference to eliminate the sound of the other wave when tuned to either one.

In Fig. 3 is shown the wiring diagram from which can be seen that the circuit used is the familiar Colpitts with grid method of modulation. While this method of modulation is not the best, it is the belief of the writer that the set will be used more for straight C. W. telegraphy than for either buzzer modulated telegraphy or radio telephony by the average experimenter, and therefore the builder can afford to sacrifice somewhat on the degree of modulation in order that he may have the two extra tubes available for use as oscillators and consequently more output without using a complicated switching arrangement to accomplish this, as would be the case if they were used for modulating.

In the wiring diagram the following designations are used:

L—Inductance (see further description).  
 C-1—Aerial tuning condenser .001 mfd.  
 C-2—Grid condenser .0005 mfd.  
 C-3—Filter condensers 1 mfd. 1000 volt tested.  
 R-1—Filament rheostats.  
 R-2—Grid leak 10,000 ohm semi-circular graphite potentiometer.  
 B-1—Filament battery. Low voltage A.C. from step down transformer may be used.  
 B-2—6 volt battery to operate buzzer and transmitter for modulation.  
 MA—Milliammeter.  
 A—Filament ammeter.  
 V—Voltmeter.  
 HWA—Hot-wire ammeter.  
 HFC—High frequency choke coil.  
 AFC—Low frequency choke coils.  
 MT—Modulation transformer.  
 Buz.—Buzzer.  
 Mic.—Microphone transmitter.  
 Sw.—S.P.D.T. switch for changing from voice to buzzer modulation.  
 G.—High voltage generator or other source of high voltage.

The range of the milliammeter and the hot-wire ammeter will be determined by the kind of tubes that are to be used. If the builder intends to use A-P tubes the range may be 0-200 milliamperes while the hot-wire ammeter may be 0-2 amperes. Although the above milliammeter will just cover the current consumption of four Radiotron or Cunningham tubes when operating under normal load, it is well to have a meter which has a small surplus in range. A stock range meter for 300 milliamperes would be preferable to the 200 milliamper instrument for these tubes. The hot-wire ammeter should likewise be of greater range for these tubes and should be the next stock range or 3 amperes. The filament ammeter may have a range of 5 amperes for A-P tubes or 10 amperes for the other tubes, but if A.C. is used to light the filaments, it should be replaced with a 0-15 volt A.C. voltmeter connected across the filament terminals instead of in series, as the ammeter is shown in the diagram. The hot-wire ammeter might well be of General Radio make, while the other instruments might be Weston or Jewell. The voltmeter V, should have a range of 500 volts, as the voltage that may be used on the Radiotrons might run up to 400 or 450 volts for a short time if the tubes are to be overloaded.

### Panel

In constructing the set it is well to start with the panel. In Fig. 3 a complete drilling layout is given with the centers of all holes, except those which will vary for different kinds of instruments, etc., that may be used, located with respect to two edges of the panel. The sizes of drills are also given and it will be seen that they are sizes that every amateur has, or should have, on hand, as they are often needed in construction of instruments.

Before attempting to do any drilling the panel should be laid out full size on a sheet of drawing paper with all holes located on it. This sheet should then be fastened to the Bakelite or Formica panel and the centers for the holes marked through on to the panel with a sharp prick punch. This method gives a good center for the drills and insures the holes being exactly where they are wanted. It is a good idea to drill through the panel with a small drill for all holes before using the specified size of drill. In drilling the observation holes a hole should be drilled through the panel with a small drill as stated above and then the countersinking should be done on both sides with the  $\frac{3}{8}$ -inch diameter drill, after which the hole is drilled through with a  $\frac{1}{4}$ -inch diameter drill. The hole is countersunk on the rear side of the panel more as a matter of neatness than anything else.

The holes for the meters present the only difficult part of the panel, and if they are cut out with a bracket saw very little difficulty should be experienced. How-

ever, if the builder does not have such a saw it will be necessary to drill a series of small holes around the circumference of the openings and afterwards smooth the hole up with a half-round file. It should be noticed that two dimensions are given for the holes for mounting the tube shelf brackets. This is on account of the difference in size of the A-P and the Radiotron or Cunningham tubes. If the builder is not certain which type of tube he will use it would be best to drill for the latter tubes as, although the A-P tubes will be rather low behind the observation holes, they can easily be seen, and this will prevent the necessity of changing the drilling later in case the tubes are changed.

The tube shelf is an easy job requiring only a few holes to be drilled, as shown in Fig. 3. Remler sockets are used and the holes provided for table mounting are to be tapped for 6-32 machine screws. They are then placed one at a time in the proper position on the tube shelf and the holes spotted on it. The holes are then drilled with a No. 27 drill and 6-32 machine screws  $\frac{1}{2}$  inch long are put through from the under side into the holes that were tapped in the socket base.

The brackets for mounting the shelf on the panel will need no description and should be made to the dimensions shown in Fig. 3 if Paragon rheostats are to be used. However, if other types of rheostats are used the builder should make sure that the shelf will clear them by at least  $\frac{1}{2}$  inch.

The sub-base should be made of wood  $\frac{1}{2}$ -inch thick by 8 inches by 14 inches and should be fastened to the panel by means of two round head nickel-plated wood screws, put through the holes provided for that purpose. The sub-base should be given a coat of shellac before fastening it to the panel.

### Inductance

The inductance, L, is wound on a Formica tube 5 inches in diameter and 6 inches long with ten grooved turns to the inch turned in its outer surface. It should be wound with either No. 12 or No. 14 bare copper wire, preferably the former if Radiotron tubes are to be used. Taps should be taken off every five turns, giving a total of fifty-five turns for the twelve taps. These taps should be made with the same size wire as that with which the inductance is wound and should be soldered on to the proper turns after the tube is wound.

The inductance is fastened to the sub-base with the supports shown in Fig. 3 and should be placed directly in line with the aerial switch on the panel, with the back part flush with the rear of the sub-base, as can be seen from the top view in Fig. 2. The taps should be brought to the switch points in as neat a manner as possible and should be kept as far apart as possible. When properly done they will fan out in a neat semi-circle. The points of the two switches are connected together with the same size wire as the inductance is wound with, in such a manner that the two outside taps are connected together, and any other tap on one switch is connected to the corresponding tap in rotation on the other side. This can be seen in Fig. 1. The best method of fastening the wires to the taps is to drill a hole a short way into the tap just large enough for the wire to slip into and then solder it in place. This method is also used in fastening the wiring of the set to the binding posts.

The aerial and grid condensers can be of any make so long as they have the plates sufficiently spaced to permit their being used on 500 volts without breaking down.



### Transformers

The 10,000 ohm potentiometer used for a grid leak is mounted on the sub-base as can be seen in the top view, Fig. 2. The modulation transformer is also mounted on the sub-base and is preferably of Acme or other standard make, although if the builder desires he can build a serviceable one himself according to dimensions given in Fig. 3. The core is made up of thin transformer core iron  $\frac{1}{2}$  inch wide to the dimensions of  $1\frac{3}{4}$  inches by  $2\frac{1}{4}$  inches. The primary consists of about 300 turns of number 26 S. C. C. wire and has a few layers of fish paper or heavy shellaced paper over it. The secondary is one section of Ford spark coil secondary with about half the wire removed. The exact amount to remove will have to be determined by trial, as the entire secondary has too high a resistance and the tubes will not oscillate with it all in. Enough should be left so that the ratio of primary to secondary turns is not too small for good modulation. A suggested method of mounting is given in Fig. 3.

The high frequency choke coil, H.F.C. in the diagram, is wound with about 300 turns of No. 26 S. S. C. wire on a thread spool. The hole in the spool is plugged with wood and two small brass angles are made and fastened to the spool ends with small wood screws. Holes are drilled in the other legs of the angles to match the holes in the tube socket bases and it is then mounted under the tube shelf by means of

two screws which also hold a socket in place. The external resistance for the 500 volt voltmeter is fastened under the shelf in a similar manner with a strip of brass. This method of fastening can be seen in Fig. 1. No definite dimensions for the angles or strap can be given as the size of the spool and resistance may vary in each particular case.

Although the filter system can be mounted directly in the cabinet it is preferable to mount it in a box or cabinet near the motor-generator set or near the transformer and rectifier if rectified A. C. is used. Although 150 milliamper capacity choke coils could be used they would be overloaded, and if the set were to be used for very long stretches, would be inefficient. It would, therefore, be advisable to use 500 milliamper capacity choke coils. The condensers should be tested at not less than 1000 volts even though no greater plate voltage than 350 volts is used, as a high voltage surge may cause a condenser of lower voltage capacity to puncture even on that low voltage.

The generator is preferably one for 500 volts, as with a 5000 ohm variable resistance in the field circuit the voltage can easily be brought down to 350 volts and yet the operator will have a chance to use a higher voltage if necessary or desirable.

### Cabinet

The cabinet is built of  $\frac{3}{8}$ -inch mahogany to the dimensions shown in Fig. 2. The joints should be

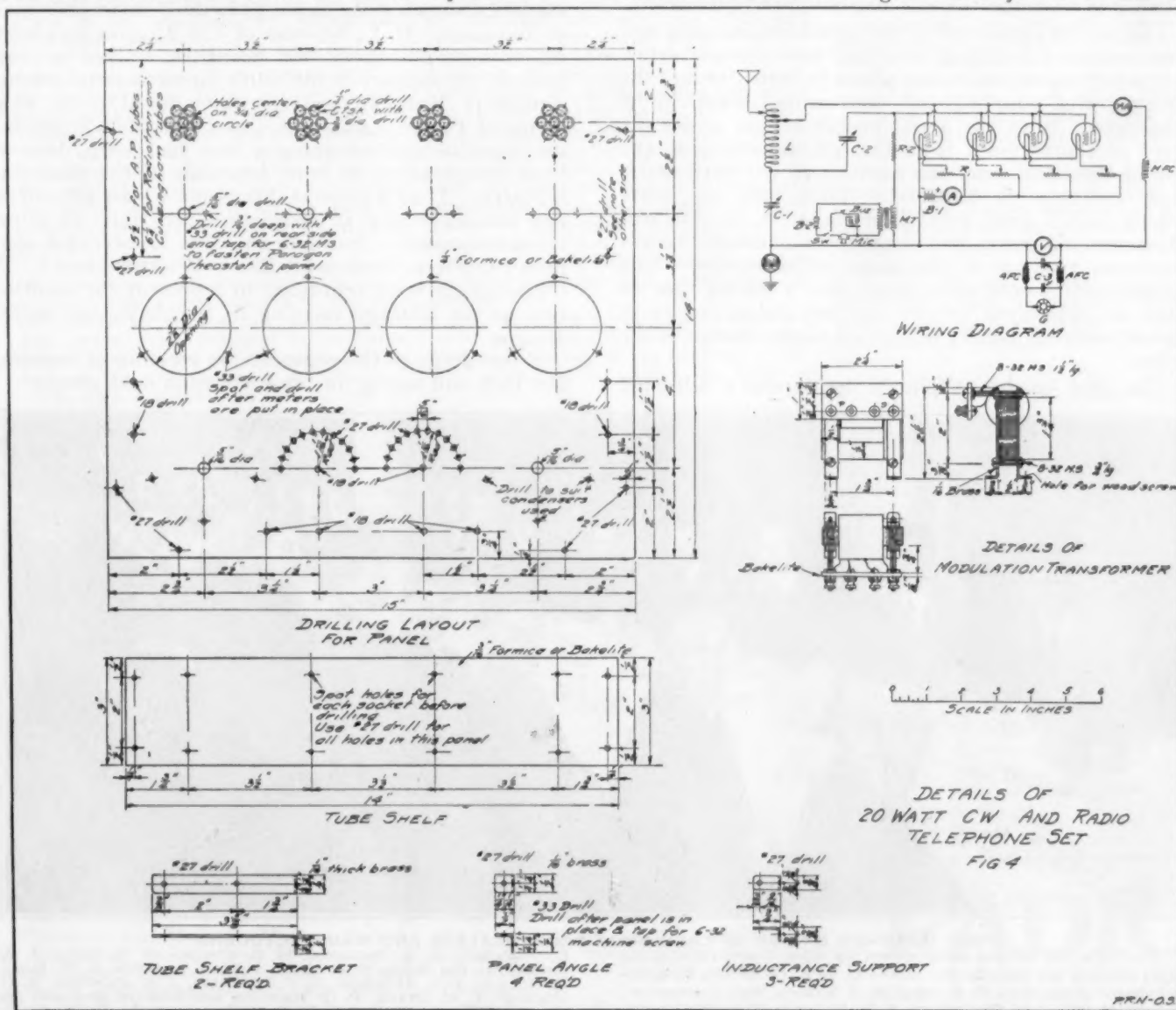


Fig. 3. Wiring diagram and construction details.

made with some form of lock joint to prevent the wood from warping and pulling apart. The cover is hinged at the back to allow removal or insertion of tubes and inspection of the interior. Small strips about  $\frac{1}{8}$ -inch thick and 1 inch wide are glued on the inside on each side of the cover and are allowed to go about  $\frac{1}{4}$  inch below the bottom edge so that when the cover is closed they are inside of the bottom part of the cabinet, preventing the cover from twisting side ways. The panel is fastened in place by means of the small brass angles shown in Fig. 3. They should be fastened to the inside of the cabinet in the proper place and then the holes spotted to match those in the panel, after which they should be drilled and tapped for machine screws to hold it in place, as noted on the drawing. The cabinet should be finished and given a good polish.

A word about the wiring: This should all be done with the same size wire as used in the inductance and should be bare copper. All joints are soldered wherever possible and connections are made as straight and short as possible and kept well apart.

#### Operation

In operating the set the tubes should first be lighted and the high voltage turned on. Care should be taken to have the aerial circuit connected to the set, as this forms part of the circuit. The bulbs will not oscillate when it is disconnected and also will be overloaded.

The switch connected to the aerial binding post and the condenser C-1 determine the wave length, while the switch connected to the plates is varied to find the best point of coupling for the various wavelengths employed. With the aerial switch set on about the third or fourth point from the left, according to the size of the aerial, vary the capacity of C-1 until maximum radiation is obtained. Then vary the plate circuit switch until maximum radiation is obtained. Maximum radiation will usually be obtained with a minimum reading of the plate milliammeter. The adjustments should all be gone over a second time as they are dependent on one another and a change in one adjustment usually requires a slight change in the others.

The grid condenser should be carefully adjusted

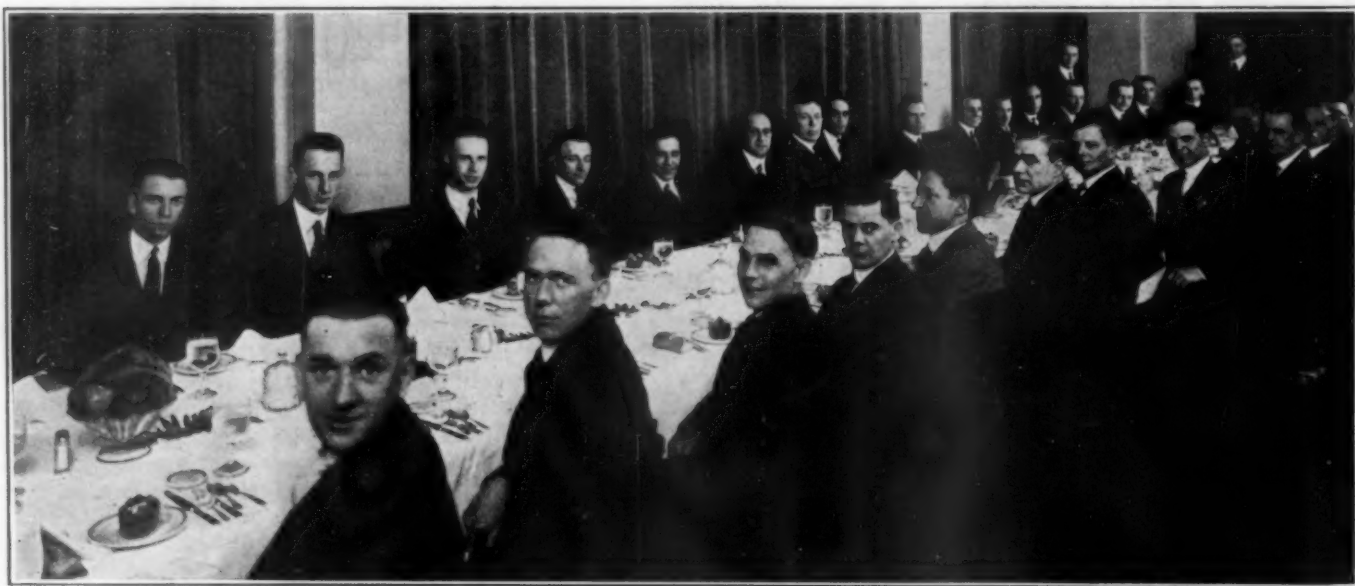
when using voice or buzzer modulation, as upon this depends the clearness of modulation in this system. The grid leak should also be carefully adjusted as a certain value is necessary to make the tubes oscillate properly. It is also necessary to change its value according to the number of tubes in use, for less number of tubes the resistance being made higher. Once set it needs no further adjustment so long as the tubes themselves or the number of tubes are not changed.

#### RADIO DEALERS GET TOGETHER

Plans for an organization of those interested in better service to the buyers of radio equipment were discussed during a get-together meeting of California radio dealers and manufacturers called at the Engineers' Club, San Francisco, August 19th, by H. W. Dickow, of the Pacific Radio News. As a result, the Pacific Radio Trade Association was successfully launched September 16th with the adoption of a constitution and by-laws, the election of officers and the appointment of committees to work for the betterment and stabilization of conditions in the radio business.

After dinner at the first meeting, which was enlivened by special radio music from the California Theater, Mr. Dickow, as toastmaster, introduced Major J. F. Dillon, U. S. Radio Inspector, who encouraged the formation of such an association and gave statistics showing the rapid growth of radio activities on the coast. H. L. Newnan of Los Angeles was next called upon to speak for Southern California and assured the support of the south for such a movement. Arthur H. Halloran was then introduced as the new editor of Pacific Radio News, and gave an address on the benefits and advantages that had been derived from co-operation by other branches of the electrical industry. After a general discussion by all present it was decided to form an association, Mr. Halloran being elected temporary chairman and Max Loewenthal, secretary pro tem. Lieutenant Ellery W. Stone and E. T. Cunningham were requested to represent the association at the Chicago meeting of the American Radio League.

Proceedings of the organization meeting of September 16th will appear in these columns next month.



**GET-TOGETHER DINNER OF CALIFORNIA RADIO DEALERS AND MANUFACTURERS**

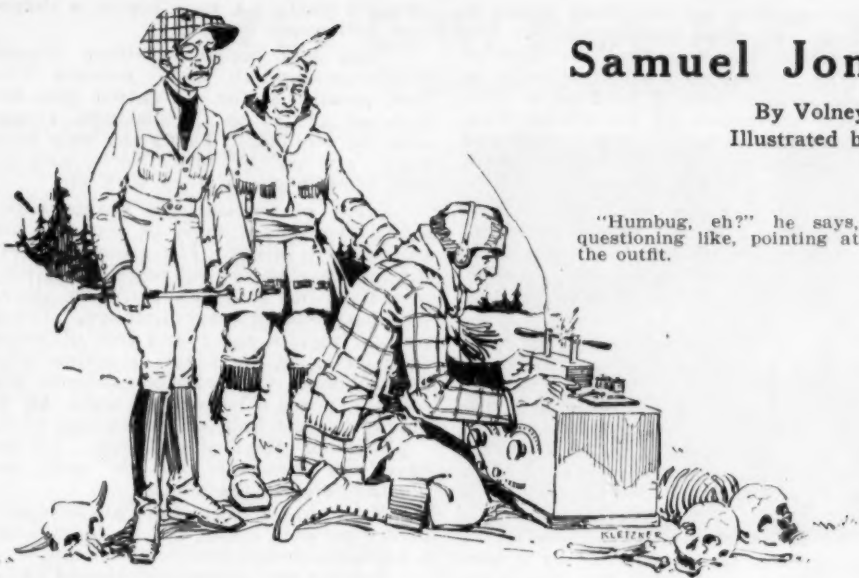
Starting at the left and going around the table those present at the initial meeting are seen by the picture to be E. G. Arnold, D. Lambert, Harry J. Rathbun, F. P. Ingel, H. J. Malarin, Max Loewenthal, Major J. F. Dillon, H. W. Dickow, A. H. Halloran, E. L. McDonnell, F. W. Maxwell, L. H. Waldron, E. T. Cunningham, S. Peterson,

L. O. Fassett, E. G. Danielson, H. L. Newnan, O. H. Miller, J. A. Ramsey, L. Ets Hokin, N. R. Kuhn, J. W. A. L. Willis, E. W. Stone, D. E. Lyon, J. L. Swindelle, A. F. Pendleton, J. K. Fairchild, H. C. Hopkins, A. E. Evans, V. G. Mathison and Edward McGuire. In charge of the concert were: B. F. McNamee of the Pacific Radio Supplies Co., and E. A. Portal of the Colin B. Kennedy Co.



## Samuel Jones—Humbug

By Volney G. Mathison  
Illustrated by H. Klatz-Ker



**O**LD MUCKASHOUK, the Snow-Eater, doesn't believe in wireless. Muckashouk is an Aleute chief with a pedigree as long as the Alaska peninsula upon which he was born—a grouchy old Indian with a widespread fame as a hunter and guide on the bear-trails of the mainland, up behind the Shumagin Islands.

For forty years he had been coming from his dugout over at Portage Bay in his kyak to Unga Island to buy tea and sugar at the Alaska Codfish Company's trading store at Unga; and all those forty years nothing had ever happened at the little codfishing village worthy of his notice until Hell-Fire, the white-man lunatic, came from Frisco with a load of poles and boxes and machinery and built K-V-I.

Hence, Muckashouk was more astonished than he would admit, when he came to Unga after a long absence to find two tall masts up on the hill, where there had never been anything before but a flagpole; and down on the ledge on the face of the cliff below, a whitepainted shack with a black pipe sticking out of one end, showing that it contained one of the gasoline-demons that bark and belch fire and go like blazes.

Intensely curious, Muckashouk footed it up the hill and studied the tall, straight masts, with their taut steel stays and shining goose-egg insulators, and the thin gleaming bronze strands that were stretched between. He mooched down to the shack, obtained admittance, and inspected the gasoline abomination and the big black iron pigs that were belted to it; stared at the clocks with the senseless dials; listened with much mystification to the cheeping of the snow-birds in the black snuff-boxes; and bravely held his ground when the fire-devils spit their purple flames from the teeth of the humming wheel.

But even all these strange things were hardly enough to convince Muckashouk that the flustery, bristle-haired *wirelessuck* fellow could really talk to the people five days away in Dutch Harbor and Mershovoi, without sending a messenger in a boat. However, he risked three good round cart-wheels and some small change to venture a message to Mouksic, the Medicine Man at Kodiak, requesting him to send by the spring mail-boat, just leaving, some medicine for a sick Malamute dog that Muckashouk had brought along with him from the mainland.

A message from Unga to Kodiak is relayed from N-P-R to N-P-Q, thence to N-P-S; and perhaps through the carelessness of some gob suffering with an overcharge of home-brew, Muckashouk's message was lost in transit.

The mail schooner came, but brought no medicine, the sick dog died, and Muckashouk had fresh proof that all white men are liars. Standing over his deceased Malamute, he glanced contemptuously up at the masts and stays and copper wires on the hill.

"Humbug!" he growled, deep down in his throat; and, having thus fully and completely expressed his opinion of radio, he relapsed into his customary silence and wordlessness that would have made the glummiest Scot a magpie in comparison. From that time Muckashouk nursed an undying grudge against devil-fire machines and *wirelessucks* in general.

And so matters stood the following spring when our old friend Samuel Jones breezed in on one of the company's fishing schooners, to pound the brass at K-V-I.

Having been duly initiated by the codfish-snailers, and later going through an unfortunate affair with a female gumshoer of the Alaska dry-squad, Samuel Jones had a few days of calm before the next hurricane burst upon him, in the shape of his lordship, Sir Ambrosius Brawley, in his radio-equipped steam yacht, "*Elizabeth*," on a tour round the world.

Sir Ambrosius had heard of the famous grizzlies of the Alaskan peninsula, and, determined upon a hunting-expedition, he anchored his trim yacht off the village of Unga and came ashore to negotiate for hunting-equipment and a guide.

Guns and provisions were had at the company's trading-store; and Muckashouk, on his semi-annual visit to the village, was signed up as guide. Tin-Pan Smith and Hammer the Head-Cracker, along with two Aleutes, were taken on as packers, and Greasy Bill shipped as cook. While preparations were under way, Lord Brawley called upon Samuel Jones and made an unexpected request. Could Mr. Jones, in view of a specified liberal remuneration, arrange a portable radio outfit and accompany the expedition, in order that his lordship might be kept in touch with her ladykins aboard the "*Elizabeth*"?

The Brainless Swede, supe of the Alaska Codfish Company, was strong for the

idea. He would be glad to see K-V-I closed up for a few weeks; it would give him a rest from the eternal howls from the home office for less expense and more fish. But Samuel Jones had a premonition that fresh calamity would surely befall him, were he to go wandering with this dense and dudish monocle-juggler, on the trails of the mainland grizzlies. He could not openly refuse without bringing down upon himself the stigma of being a timid tenderfoot, and that meant much attendant evil; so he prudently chose a convenient loophole of escape.

### II

**L**IKE to go first-rate, I assures Sir Ambrosius; but I haven't got anything I could rig up a portable set with. "Don't let that worry you, Sam," chips in old Dopey Drifffield, postmaster, squaw-masher, an' town pest. "Ya kin have my ham set Hell-Fire fixed up fer me. I'm tired at it, anyhow."

"Thanks, Dopey," I answers, gi-ar-in' at him. There was no refusin' now. A dory-carpenter slaps together a light box, in which I puts Dopey's loose-coupler an' audion-panel, his two-inch spark-coil, straight-gap, sendin'-key, an' a little aerial-switch. In another box, I stows eighteen dry-batteries, six for the audion an' twelve for the spark-coil, which I figures will hold up for intermittent work durin' the three or four weeks of the huntin'-trip.

"The carpenter also fixes up a light, jointed wooden mast, which along with a couple of insulators and a coil of aerial-wire, I puts aboard the gas-boat Sir Ambrosius has chartered to carry us to the mainland.

"Seein' the outfit come aboard, old Muckashouk looks it over with an angry frown; then, with a kind'a sour smile, he studies me a while out of the corner of his eye.

"Humbug!" he croaks; after which he freezes up once more, like a mainland glacier.

"At last we gets headed up the Straits of Nagai for the mainland, an' the '*Elizabeth*' follows us up to Portage Bay, where she drops anchor. We piles our gear ashore in Man-Eater's Cove, where we spends the first night. Next mornin' the packers bundle up the stuff, which, as Tin-Pan remarks to the Head-Cracker, is enough to fit out an invasion into Siberia.

"For three days we struggles up Skeleton Gulch to Dead-Man's Plateau, a broad piece of high snow-country, about twenty miles inland from Portage Bay, surrounded by great mountains of snow-covered granite, an' Pavloff Volcano smokin' in the background, like a gigantic inverted ice-cream cone. Off to the south'ard, we could see the Shumagin Islands, lookin' like white sugar lumps in the Pacific; an' on the other side of the peninsula, to the north, we could make out great fields of pack-ice floatin' on the

Just say:

# RADIO

to your newsdealer on October 23th and he will hand you the snappiest radio publication that you have ever read.

cold, gray surface of the Bering Sea.

"It's a grand sight, ain't it!" I exclaims to Tin-Pan, alongside me.

"Yes, fer a tenderfoot that ain't got nothin' else t' do but look at it!" growls Tin-Pan, throwin' his enormous bundle down in the snow. 'I'd like t' know what his dukelet's got in this ship-load I bin packin' all over th' Laska peninsula. It's big enough to contain a coupla circus tents an' all th' side-shows.

"Muckashouk had brought us up alongside of Silver Creek, where there was water, an' alder-brush for a fire. We clears away a place an' make camp. There was one little tent for his lordly skeezix, an' another larger one for the remainin' seven of us.

"Greasy Bill fixes up some supper, after which Sir Ambrosius opens up Tin-Pan's pack an' takes out a rubber bundle an' some wooden sticks. We couldn't make head or tail of the thing till he sets it up;—an' then we sees it's a foldin' bath-tub!

"Well, I'm a dirty salmon-eater!" groans Tin-Pan, as he watches his lordship settin' up over the tub a little tent, which was also in the bundle. "I think that Tin-Pan Smith, who's et more sourdough biscuits than any denizen livin' on this here peninsula, should live to see hisself packin'—that! I'm ruined! I'm disgraced fer life!" an' he begins to snifle.

"It's a howlin' outrage!" sympathizes the Head-Cracker, with a catch in his voice. "I never thought people could be so cussed ornery. Hereafter, we pack no bundles without seein' what's in 'em!"

"About this time Sir Ambrosius has his bathin' establishment ready for operation.

"Aw—I sy!" he chirps to Greasy Bill, who's just finished cleanin' his fryin'-pan. "Would you be so kind as to procure a drop of wath in one of those tin—aw—containuhs and heat it a bit oveh th' fiuh. I 'aven't had a blooming bawth these three days—I feah I shall become ill!"

"Ill," he says!" sniffs the Head-Cracker, "I bet old Muckashouk here ain't had a bath in fourteen years!"

"Fifteen," says Muckashouk.

"Cursin' under his breath till he was black in the face, Greasy Bill gets a can of water an' holds it over the fire on a stick, while Sir Ambrosius holds onto his monocle an' superintends the job.

"Meanwhile, the Head-Cracker helps me stick up the jointed wireless mast in a crevice of a handy granite cliff, an' I manages a kind of a ground in the creek. Openin' up the apparatus-box, I adjusts the coil for a nice, smooth spark. By the time I had her all ready it was about dark, so I gives the 'Elizabeth' a call.

"It was all of twenty miles from Dead-Man's Plateau to Portage Bay, but we were on pretty high ground, an' anyway in Alaska wireless gives results; so I wasn't much surprised to hear the bird on the yacht come back, right off the bat. When Sir Ambrosius finishes his bath, I asks him if he's got any message.

"Why—aw—yes," he replies, pleased-like, "You may inform her ladyship that the expedition is progressing—aw—beautifully; and that I have just had my bawth. Indubitably she will be glad to know that.

"As I works the 'Elizabeth' I notices that old Muckashouk keeps stickin' around, watchin' me with a kind of a sour smile! an' somehow it bothers me a good deal.

### III

THE huntin' progresses with pretty good success; Sir Ambrosius succeeds in baggin' a couple of old mangy-

lookin' trophies; an' everybody seems to be quite contented except myself. Old Muckashouk keeps worryin' me more all the time. Whenever I work the outfit, he stands around with a kind of a dark, broodin' expression on his homely map, until finally I begins to feel sure that he's plottin' some kind of devilment against me an' the outfit.

"One day Muckashouk tells Sir Ambrosius about a famous buryin'-ground of the Aleutes, called Skull Island, thirty miles out in the Bering Sea; an' of course old I-Say makes up his mind he's got to see it.

"He tells us to bréak camp, but right then there begins a row about that bath-tub. Sir Ambrosius tries to insist on somebody packin' the thing, but the Head-Cracker rises up an' delivers a oration on the freedom of America an' human rights an' liberties that would'a made Daniel Webster sound like a street-corner sky-pilot on a soap-box.

"We absolutely an' perpetually refuse to be dishonored an' polluted by a horribul rubber bath-tub!" he concludes, wrathful-like. "We've packed feather pillers, an' we've packed canned termaters—we've even packed bakin'-powder,—but we don't transport that outrageous article from this place, even if the hills fall an' the mountains bust open!"

"So Sir Ambrosius packs it himself.

"We moves camp down to Herendeen Bay, over on the Bering Sea side of the peninsula, where Muckashouk charts a small open gas-boat from an old Indian shackin' there. As we planned to come back a different way, we stows all our gear in the boat.

"Right here, I gets my old reliable hunch that calamity is comin' my way on this trip, an' I tries to head it off.

"We better not go out there," I advises Sir Ambrosius, "I heard a weather report from Dutch Harbor that a terrific southwest hurricane is comin' this way. Safest thing is to go back to Portage Bay.

"You lie!" snaps Muckashouk, with a black scowl. "Me long time savvy—no come storm!"

"So we embarks; an' it was my luck that the sun shines an' the sea lies calm, like it never does in the Bering Sea once in fifty years. The gas-boat chugs along before a light southwesterly breeze; an' every little while old Muckashouk would squint up at the clear sky, an' then sneer scornful-like at me an' my wireless-box, until he blasted near gets my goat.

"Early in the afternoon, we sights Skull Island, a low, flat chunk of bare-lookin' black rock, about two thirds of a mile long, an' maybe half as wide, standin' solitary and gloomy out in the sea.

"I don't like th' idea a comin' way out here in this rickety old tub," grumbles the Head-Cracker, gazin' anxious-like back at the mainland, already droppin' down below the horizon. "There's a current runs like blazes out here; an' if we break down, it'll take us straight out into th' Berin' Sea about seven miles an' hour.

"I soon observes that this is a fact, for it takes us a long time to get up to the island. As we get close, I can see that the island is fringed with dark bluffs of volcanic rock, an' small reefy coves scattered in among 'em, one of which we runs into. Makin' a landin' we all pile ashore, leavin' Muckashouk in charge of the boat.

"We scrambles up onto the rough black rock above the beach,—an' then we halts right there. Standin' thick everywhere among the rocks an' boulders were hundreds upon hundreds of rude,

elevated platforms, each bearin' a shapeless, half-rotted bundle.

"This is a reg'lar old-time Siwash buryin'-ground, all right," mutters Tin-Pan, pointin' at the old rusted guns an' pots an' kettles on the platform, alongside the bundles. "That's the way they bury 'em—up in bird's nests, with all their worldly goods along with 'em."

"A few of the open-air graves looks kind'a recent, but most of 'em was old an' fallen to pieces. The ground was all littered up with the old rifles an' kettles, mixed up with bones an' skulls an' skeletons scattered in every direction. There was no part of the island free of 'em—even down on the beach, I notices ribs an' backbones strewed around among the rocks. It was a hair-raisin' sight; an' it didn't take me long to get enough of it.

"Nix on this!" I declares. "I'll be havin' th' jim-jams for th' next six months—me for the boat!"

"You said it!" pants Tin-Pan, followin' hard after me, "I ain't got no longin' fer a residence round this here island!"

"Neither me!" shivers the Head-Cracker. We all hot-foots it back down to the beach,—an' Sir Ambrosius ain't hangin' behind none to speak of. "When Greasy Bill cranks up the engine, I notices that she don't seem to sound right; an' sure enough, just as we shoves off, she stops dead.

"Smells like gasoline's been leakin' some place," sniffs the Head-Cracker.

"Tin-Pan rams a stick down in the gas-tank, an' turns ta sickly green.

"She's bone dry!" he gasps.

"Lookin' over the pipin', I discovers that it's cracked off at the carburetor, an' let the tank drain down into the slush-water in the bilges.

"We're in fer it now!" mumbles the Head-Cracker, talkin' like his mouth is full of glue, "We could make a sail out'a our blankets, but the wind's blowin' dead off the mainland—prob'ly'll keep blowin' that way till next fall, too. An' we can't buck that current paddlin'—this clumsy old tub ain't no Aleute kyak."

"I thought I seen a extra ten-gallon can of gas someplace," puffs Greasy Bill, who's rummagin' around in the bow; "but I was mistaken."

"Aw—I sy!" chirps Sir Ambrosius, who's just beginnin' to get it through his dense bean what's happened. "We really must do something. The idea of spending the night 'ere among these bones and things is—aw—rawther disagreeable, don'cha know!"

"Disagreeable be ———!" busts out the Head-Cracker, "It's one rotten blazin' blasted devil of a mess! There ain't even fresh water on this pile 'a bones an' rock!"

"Stop talkin' like that!" yells Tin-Pan, jumpin' up an' glarin' at the Head-Cracker. "I can't stand it! I can't stand it, I tell ya!"

"There was a gloomy silence; an' then Muckashouk, wearin' his old sour smile, speaks for the first an' last time durin' this conference.

"Wirelessuck!"

"Sufferin' cats, what's the matter with me!" I exclaims, jumpin' up. We gets the box of apparatus out of the boat, an' the gang sets up the little mast. In about fifteen minutes the outfit is ready for action, but by this time my enthusiasm is fallin' off.

"The island bein' low an' flat, there was no way to get more antenna elevation than the thirty feet of the single mast. The 'Elizabeth' was about fifty miles away, with a range of mountains between, an' it looked like a slim chance

(Continued on Page 112)



# The C.W. Club of California

Conducted by Lawrence Mott, Associate Editor

## DESCRIPTION OF 6XAD, CATALINA ISLAND

With the installation of his new 50-watt tube set, our associate editor, Mr. Lawrence Mott of Avalon, Cal., has one of the most up-to-date stations in Southern California. From the half-tone of his new station you can see that the spark has absolutely no chance at 6XAD.

Mr. Mott's first C.W. set employed 5-watt tubes. Exceptionally good work was accomplished with his initial equipment. The rapid development of C.W. and the advent of larger power tubes on the market prompted 6XAD to take another step in the direction of better C.W. work.

There is only one non-commercial station on Catalina Island and that is 6XAD. We will expect numerous record-breaking reports from Mr. Mott during the coming winter season. By that time, no doubt, the C.W. Club of California will be a "going concern" under the supervision of the Avalon station, and the use of C.W. for relay work in the West will soon replace the spark.



6XAD'S HOOKUP

Our readers will remember the photo of 6XAD's little C.W. set used by Mr. Mott some months ago. Look at the station now—C.W. apparatus from one end of the table to the other. All transmitting apparatus was constructed to Mr. Mott's specifications. Everything is downright modern. Looks like 6XAD will soon compete with 2QR in working Scotland.

## LARGE NUMBER OF C.W. CLUB MEMBERS MAKE NECESSARY THE FOLLOWING REVISIONS IN SCHEDULE:

MONDAY, WEDNESDAY and FRIDAY nights these stations listed herewith will call for ten minutes each at the allotted period.

Time	Station	Wave	Name and Address
9:00 p.m.	6XAD	240 & 375	Lawrence Mott, Avalon, Cal.
9:10 p.m.	7OZ	200	Garrett Lewis, 1745 Willamette St., Eugene, Oregon.
9:20 p.m.	6PI	200	B. McGlashan, 233 W. 21st, Los Angeles.
9:30 p.m.	6EN	200	H. Duvall, 4965 Wadsworth, Los Angeles.
9:40 p.m.	6WU	200	C. Richardson, Los Angeles.
9:50 p.m.	6JE	200	C. Blalack, Los Angeles.
10:00 p.m.	6MK	200	L. B. Benjamin, Los Angeles.
10:10 p.m.	6ALE	200	W. W. Lindsay, Los Angeles.
10:20 p.m.	6KA	200	F. E. Nikirk, Los Angeles.
10:30 p.m.	6HU	200	H. G. Beck, Wilmington, Cal.
10:40 p.m.	6ADU	200	R. P. McKenzie, Los Angeles.
10:50 p.m.	6EF	200	C. G. Widing, Los Angeles.
11:00 p.m.	6IT	200	C. E. Rich, Glendale, Cal.

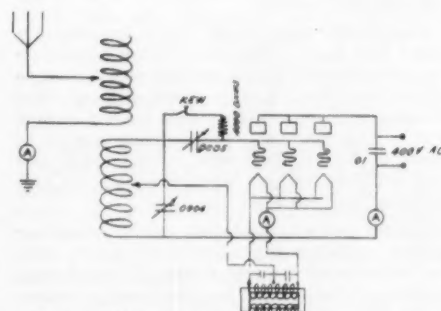
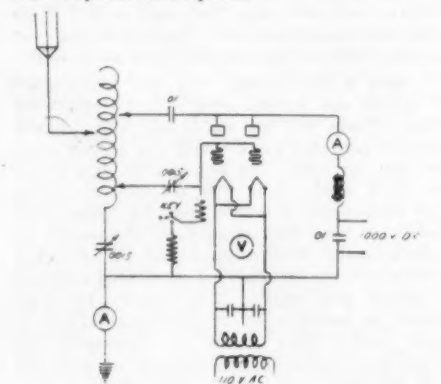
TUESDAY, THURSDAY and SATURDAY NIGHTS the following stations will call for ten minutes each:

Time	Station	Wave	Name and Address.
9:00 p.m.	6UC	200	C. F. Filstead, Los Angeles.
9:10 p.m.	6XN	375	A. A. Kluge, Los Angeles.
9:20 p.m.	6XD	375	Western Radio, Los Angeles.
9:30 p.m.	6AQA	200	G. S. Tichenor, Los Angeles.
9:40 p.m.	6KP	200	O. S. Garretson, Eagle Rock City, Cal.
9:50 p.m.	6BA	200	H. Newman, Wesrad, Los Angeles.
10:00 p.m.	6HK	200	F. Croswell Jr., Los Angeles.
10:10 p.m.	6ZE	375	D. B. McGown, San Francisco.
10:20 p.m.	7XF	375	Northwestern Radio Mfg. Co., Portland.
10:30 p.m.	6ZAD	375	J. J. Mahler, Napa, Cal.
10:40 p.m.	6ZX	375	J. V. Wise, Fresno, Cal.
10:50 p.m.	5ZA	375	Louis Falconi, Roswell, New Mexico.
11:00 p.m.	6AKH	200	C. Maass, San Francisco.

These changes were made necessary by the ever increasing number of members who are joining the C.W. ranks. Many requests have been received to give each station ten minutes' working time instead of five minutes, as has heretofore been the custom. In order to make this change, it was necessary for us to split up the working nights of the members, giving them an opportunity of working ten minutes every other night instead of five minutes every night. There will be no regular calling and working schedule on Sunday nights. This will be made a "free for all" evening and is favored by the majority of the members.

We cannot impress upon the members too strongly the fact that the editor of this department desires to have a month-

ly report of the C.W. work accomplished during the month. This information will be published monthly on this page, and it is to the interest of all concerned to have each and every member send in a list of C.W. stations worked and heard during the month. This department is to be the mouthpiece of the ever growing C.W. organization that is being formed on the Pacific Coast. Photographs of stations entered in the above schedule are particularly desirable. Most of all we will ask you to send us some "C.W. BRIEFS" every month. Tell us what new wrinkles you have found in your C.W. work. Everybody wants to know about them. Let's make this the liveliest and fastest growing C.W. Club in the field. You can do your share by sending a monthly report to Mr. Mott at Avalon.



Wiring Diagram of 6XAD.

At the extreme left is seen the power plant especially built by the Advance Electric Co., of Los Angeles, to operate the 100-watt set—on 375. A 110 a.c. motor drives the generator, that delivers from 100 to 1000 volts d.c., and a plate current up to 500 milliamperes. By a step-down transformer, shown next to the right, the filament current for the Radio Corporation tubes (203) is derived, from 1-10 volts.

Next comes the 2-tube transmitter itself, which the Western Radio Electric Co., Los Angeles, helped him build, using the above-mentioned tubes as shown in the accompanying print of hook-up. From 1.9—3.1 amps is the range—so far—in antenna current. But Mr. Mott is installing complete new ground and aerial systems in the early autumn, by which he will attain far better results than this!

(Continued on Page 92)

On the operating desk are: a Kennedy long-wave receiver and Kennedy 2-step amplifier; a Grebe short-wave, and 2-step amplifier—with special "pickle tube" detector; and on the extreme right is the transmitter used for short wave lengths—operating on 110 a.c., taken from the city main, through a special transformer. Radio Corporation tubes—UV202—5-watt—are used on this set, and Mr. Mott has been reported at 2000 miles' range on it. The amperage of the smaller set is from 1.2—2 amps, with three tubes working.

As Mr. Mott is also U. S. Deputy Game Warden at Catalina his passion for big game fishing is clearly shown by the excellent photographs on the wall of his den—all of swordfish, and tuna, taken by him and his guests—all fish more than usually large. What with being an ardent angler, that which he calls "an over-worked writer," and a close follower of the radio trail, our Associate Editor has not overly-much time to let the grass grow either beneath his fingers or his feet!

#### C. W. NEWSLETS

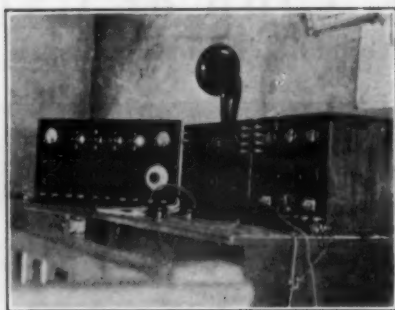
6AUL has been heard in British Columbia. He uses a four-tube set, hooked-up in Heising style.

6AUN has been heard by 7ZJ and 7EN. He used, at the time, a small set employing only one five-watt tube. His radiation without overload was eight tenths of an amp. Great work for only one tube. His new set will bring better news next month.

6AKH has almost finished his classy four-tube C.W. set. The Heising circuit will be used. Two separate panels comprise the transmitter. One is a power panel, the other is the oscillator panel. An ESCO 100-watt motor generator will feed the animal. A photo of the station will appear in an early issue on the C.W. page.

Many fellows won't have a C.W. set unless they can also have a spark set for calling purposes. What's the use of such foolishness with 26 members already signed-up for the C.W. Club? The trouble with C.W. is that the fellows will not tune for it. Don't keep your dials stuck on 200 meters. C.W. tunes too sharp. Juggle those dials a little and you'll be surprised at what you'll hear. But remember—you must tune sharp.

Wm. Woods, formerly of Oakland, Cal., has moved himself and his station to British Columbia. He is going to install a powerful C.W. set in the Barron Hotel and expects to have it on the job in about a month. That's a good place for a C.W. station, as it will be the aim of every C.W. Club member to work with Woods. He will broadcast the latest quotations on "Canadian Club" and other wet goods of old-time fame. Treat him right on the air and he will send you an invite to come up there to spend your vacation. Photo and full description of his new set coming up.



6AWT

6ALE has done some dandy work with his C.W. set. Look at this list of "heard and worked": 5ZA, on I.C.W. Very QSA. (6EN), (6EX), (6GN), (6HP), (6KP), (6MH), (6OH), (6PJ), (6TV), (6WZ), (6XD, phone), (6ZN), (6ZX-200 miles daylight), (6AAK), (6ABW), (6AGF), (6ALU, I.C.W.), (6AMW), (6APH), (6AUL—phone and C.W.), (6ZAD—C.W. old 6IY, (7ED), (7BK), (7KM), (7MF), (7ZJ). Great work, 6ALE. Keep it up.

7MF of Eugene, Oregon, and 7OZ, also of Eugene, have built 10-watt C.W. sets and tests have been arranged for the end of this month.

Mr. D. H. Keet of Riverside, Cal., reports that two new 100-watt C.W. sets will be in operation in that city within a few weeks. The Southland is going wild over C.W.

Mr. H. Romander of Smith River, Calif. (near the Oregon line) is building a 50-watt C.W. set. It will be on the air within a month.

6ZN. will also be on the job with a 100-watt C.W. set.

6GR will content himself with 10 watts.

6ASJ says that he wasted just about enough time fooling around with I.C.W. and will hereafter stick fast to the pure and unadulterated C.W. Next!!

6AUL of 'Frisco is being heard very nicely in Reedley, Calif., says Mr. Lindsay Jr. His C.W. signals are also coming through in grand style.

6ZAD has been pounding-in heavy on his C.W. The gang "down south" say he's very QSA.

6ALE, Mr. Lindsay, Reedley, Cal., says that he receives dozens of letters and cards from fellows who have been hearing his C.W. Almost everybody who writes 6ALE wants to know all about his set, how to build it, how it is wired, etc. The best way to answer that ques-

#### MY EXPERIENCES WITH C.W.

By C. Chandlee Pidgeon

RECENTLY an article on the construction of a \$100 C.W. set was brought to my attention. Being a C.W. experimenter, I at once became interested, but the cost of construction of the set that I had planned was prohibitive. I therefore studied advertisements in the radio magazines and consumed the contents of the various CW catalogues with the result that it was possible for me to construct a CW set for \$50. The following is a list of what I used for the construction of the same:

6 lbs. Silicon Steel at 35c.....	\$ 2.10
1-2 lb. No. 30 enameled wire ....	1.06
1 lb. No. 20 SCC wire .....	1.58
18 ft. No. 14 DCC wire .....	.30
3 power tubes .....	24.00
3 sockets .....	4.50
3 rheostats (2½ amp.) .....	5.25
1 key .....	2.00
36 ft. copper tubing .....	4.12
Incidentals .....	5.00
Total .....	\$49.91

The wire and silicon steel were used for building a transformer to supply the filaments and plate current for the tubes. The set may either be self-rectifying or an electrolytic rectifier may be used with choke coils and condensers for the smoothing out circuit, such as used by Dunnam at 3AAO.

I have a motor-boat coil, the secondaries of which are wound with No. 37 enameled wire. These will act as choke coils. I will make a core for each, using the silicon steel for this purpose. The secondaries of a quarter inch spark coil will do just as well. The electrolytic rectifier may be made from sheets of lead and aluminum, suspended in jelly glasses. The solution can be of either ammonium phosphate or a saturated solution of borax and water. The electrolytic condenser is constructed of aluminum about ½ inch thick. Two plates are suspended in small jars containing a solution of ammonium phosphate or borax. The above apparatus covers the "Incidentals" listed in the price column above.

The silicon steel is also for a transformer core. Cut it to a size of 5 inches square on the outside and 2 inches square for the inside with 1 inch by 1½ inch cross section. The primary will require 458 turns of No. 20 SCC wire. The filament winding consists of 34 turns of No. 14 DCC wire. The plate circuit will require two windings, each of 1500 turns of No. 30 wire.

A good 23 plate condenser may be used for tuning. The construction cost can be still further reduced by substituting 7-22 stranded phosphor bronze wire for the copper tubing. If an ammeter is required for the antenna circuit the construction cost will be increased by \$6. A couple of small spark coils for the chokes can be obtained from practically any automobile repair shop.

tion, Mr. Lindsay, is to send the dope to the editor of this page. We'll put it in shape for you, and everybody in the U.S. will know about 6ALE.

The following letter is published for the purpose of showing our readers the wide scope of "Pacific Radio News."

#### TRANSLATION FROM THE FRENCH

RAOUL MOHA

Electrician—Radiotelegrapher, Member of the French Society for the Study of Radio.  
11 Avenue Pasteur, Alger, Algeria.

Mr. Raoul Moha sends his best 73's to the Manager of the Pacific Radio Supplies Co., for the address of which he is indebted to that fine magazine, Pacific Radio News. On the strength of this advertisement he earnestly beseeches that he be sent a free sample, without duty, of the A-P Rectifying tube, said tube to be used to change 110 volts 50 cycles to 350 volts direct current.

He also wishes information on sockets for these tubes, as well as data on the primary and secondary of the step-up transformer required; likewise data on the inductances required for filtering the output of the rectifiers. In all the foregoing give the sizes of the wires, the thickness of the sheets, and the dimensions of the magnetic circuits.  
(Signed) Thanks in advance,

R. MOHA.





## WITH THE RADIO INSPECTOR

This department is conducted by the Radio Inspector of the Sixth District. Questions are answered free of charge. Your name will not be published. Initial your letters only.

Send Your Questions to: Radio Inspector's Dept. "Pacific Radio News"

September 1, 1921.

Editor Pacific Radio News,  
San Francisco, Calif.

Dear Sir:

It has come to my attention that many amateurs are breaking the U. S. radio laws, both as regards to power and to wave length.

One evening recently I heard a station start up, and call another nearby to ask on what wave he was sending, showing that he had no idea himself whether his apparatus was adjusted to comply with the requirements of the law. I checked this party, and found that he was on about 260 meters. The station with whom he was working came back at him, and told him that he was OK, and on 200, which shows how very accurate (?) such a practice is.

This appears to be a common custom among many amateurs, although they do not realize that they are breaking the law by so doing. The only safe and proper way to tune a transmitter is to use a wavemeter (strange to say), whose extreme simplicity is usually not recognized by the majority of amateurs. A small variable condenser, with about a 25 turn inductance coil, such as a honeycomb, with the addition of a crystal detector, makes a wavemeter of fair efficiency, with a pair of telephone receivers to indicate resonance. There is nothing difficult about that, certainly, and in most cases all of these instruments can be found around even the smallest amateur station. The calibration of the instrument is a puzzle to most, however, but even this can be done very simply, by comparison with a standard instrument. The meters of this department are available for this purpose whenever amateurs wish to avail themselves of the privilege, for which service there is no charge.

Another evening I measured the waves of eight stations, all within a period of about a half an hour, and of the eight, seven were transmitting on wave lengths in excess of 200 meters, and one of these was on about 280 meters. Proper action was taken in all cases.

In spite of repeated warnings, there still seems to be a large number of amateurs who do not know that the law requires a reduction of power when working with nearby stations. The law states that "a minimum of power necessary to insure safe communication" shall be used at all times. According to some of the signals I have heard, it seems that a half kilowatt is needed to insure safe (?) communication over a distance of a few miles, in many cases, and a large number of stations seem to work with this efficiency (?) all the time. Amateurs may be interested to know that if detected, this will constitute sufficient evidence for the suspension, or even the possible cancellation of their licenses.

Respectfully,

D. B. McGOWN,  
Assistant Radio Inspector,  
U. S. Dept. of Commerce.

### Questions Answered BY THE Radio Inspector

**Q.—When a commercial operator's license is suspended does he lose the usual 20 per cent credit when applying for a renewal of the suspended license after it expires? (L. C., San Francisco.)**

**Ans.** No, although he will not be allowed to apply for re-examination until the suspension period is over. Whether or not he may apply for a license of higher grade than he holds will also be given consideration, in connection with the suspension, when he apply for a new license.

**Q.—In your estimation, what is the best formula for calculating the natural period of an aerial when its length, number of wires, etc. are known? (C. J., Alameda, Cal.)**

**Ans.** The best formula to use to get the natural period of an antenna is to MEASURE IT. There is no formula that is accurate. The old system of multiplying the mechanical length of the antenna system by 4.5 gives a rough approximation, although it is at best very inaccurate. One with experience can usually judge the natural period almost as well as it can be calculated by ordinary means. So many factors, such as nearby metallic objects, sag of wires, etc., enter into the matter that it is almost impossible to calculate it exactly.

**Q.—Can you briefly tell me what new radio agreements were made at the recent radio communication conference in Europe? (K. M., Oakland.)**

**Ans.** No definite data yet received on this matter.

**Q.—Will it be possible for the Radio Inspector's office to inform me whether a Canadian license operator can secure employment legally at a U. S. land station if he passes the U. S. commercial examination? (A. DeC., Victoria.)**

**Ans.** According to the U. S. Radio Laws a Canadian, or any foreigner, may operate a U. S. Radio Station, either ship or land, provided he has a valid commercial license of the grade required for the station at which he desires to operate.

**Q.—After reading the editorial in the September issue of "Pacific Radio News" in which the editor states that unlicensed stations should be warned in person by local amateurs before being reported to the Radio Inspector, I would like to ask if the editor is correct in this statement. Should not the Radio Inspector be notified at once in order to have the law enforced? (B. F., Pasadena, Cal.)**

**Ans.** In most cases it will be found that the offender operating unlawfully is doing so without knowledge of the laws he is breaking, and a word from someone interested will usually serve as sufficient warning, and will cause the guilty person to obey the law, although the Radio Inspector's office should also be notified.

**Q.—I desire to install C. W. transmitters in Nevada to communicate between various offices of a certain company in that state. We will handle business pertaining to the company only. Can these stations be licensed under the amateur class or must they be commercially licensed and have commercial men to operate them? No paid business will be handled. (C. N., Nevada.)**

**Ans.** They must be licensed as limited commercial, which will restrict them to operation between the stations of the company, on certain specified wavelengths designated on the license. They will not be allowed to communicate with any other stations, under these licenses, except in emergencies. If it is found that the effect of their radiated energy reaches the coast, they must be classed as "coastal" stations, and at least commercial second class licensed operators will be required. If they are classed as "inland" stations the class of operators will be designated in the license, when issued. Suggest that you write to the Radio Inspector's Office, 215 Custom House, San Francisco, Calif., for further information.

**Q.—Why are there no women operators employed at land stations? I have heard that the government regulations do not permit their employment as ship operators, but does this also apply to land stations? (Mrs. S., San Francisco.)**

**Ans.** No restrictions are placed on the sex of applicants for radio license, nor on where they may be employed. It is understood, however, that there is little, if any opening for women at any radio stations. This office has no record of any women being employed at any radio stations, either ship or shore.

**Q.—I have read much about transmitting with an ordinary buzzer and learn that it can work several miles under good conditions. Must such a miniature device be licensed in order to be allowed to operate, especially where it may be situated in a remote part of the state? (A. D., Sacramento, Cal.)**

**Ans.** Yes. This station MAY INTERFERE with the reception of signals or radiograms the origin of which is beyond the state, and therefore such a station must be licensed.

**Q.—When the Department of Commerce confiscates an amateur's equipment does the amateur have it returned to him when his license for operating the station expires? (G. D., San Diego, Cal.)**

**Ans.** According to law, confiscated apparatus becomes property of the government, and will not be returned to the former owner at any time. Apparatus

One Little Word:

# RADIO

with a big meaning—  
It's the new name of the "PRN." Don't forget it!

SEIZED, during the war, by the navy department, may be returned to the owner, upon application to the District Communication Superintendent, of the Naval District in which the seizure was made although it is believed that most of this apparatus is already in the hands of its proper owners.

**Q.—I have a small radio telephone set. Can I play music for the benefit of other amateurs? (A. M. B., San Francisco.)**

**Ans.** No. Concerts must only be sent out by certain stations designated for that purpose by the Radio Inspector, at designated times. If anyone was allowed to send them out promiscuously, it would cause endless interference, and trouble, as well as monopolization of the "circuit" by one party to the exclusion of all others.

### EXAMINATION FOR RADIO INSPECTOR

The United States Civil Service Commission announces an open competitive examination for radio inspector on October 5, 1921. Vacancies in the positions of radio inspector and assistant radio inspector in the Bureau of Navigation, Department of Commerce, at \$1,800 to \$2,200 a year, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The duties will be primarily to inspect the radio apparatus on steamships, to insure its compliance with the law, and to inspect shore stations. The inspectors may also be called upon to examine radio operators. The duties of radio inspectors require some office experience, therefore competitors should outline fully in their applications any office experience they may have had. Competitors will be examined on theoretical and practical questions in the construction, use, and adjustment of radio apparatus and auxiliaries (rating of 50) and education and experience in the line of the required duties (rating of 50).

Applicants must have received a bachelor of science degree from a school of recognized standing, such educational training to have included a special course in radio or kindred sciences, or show that they are senior students in such institutions; or have had the equivalent of a high school education and at least two years' experience in special radio work, such as the manufacture, installation, or adjustment of commercial or governmental wireless apparatus. It is essential that applicants be wireless telegraph operators.

Applicants must have reached their twenty-first but not their fiftieth birthday on the date of the examination. These age limits do not apply to persons entitled to preference because of military or naval service.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C., or to the Secretary of the United States Civil Service Board at any place listed hereon. Applications should be properly executed, excluding the medical and county officer's certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant.

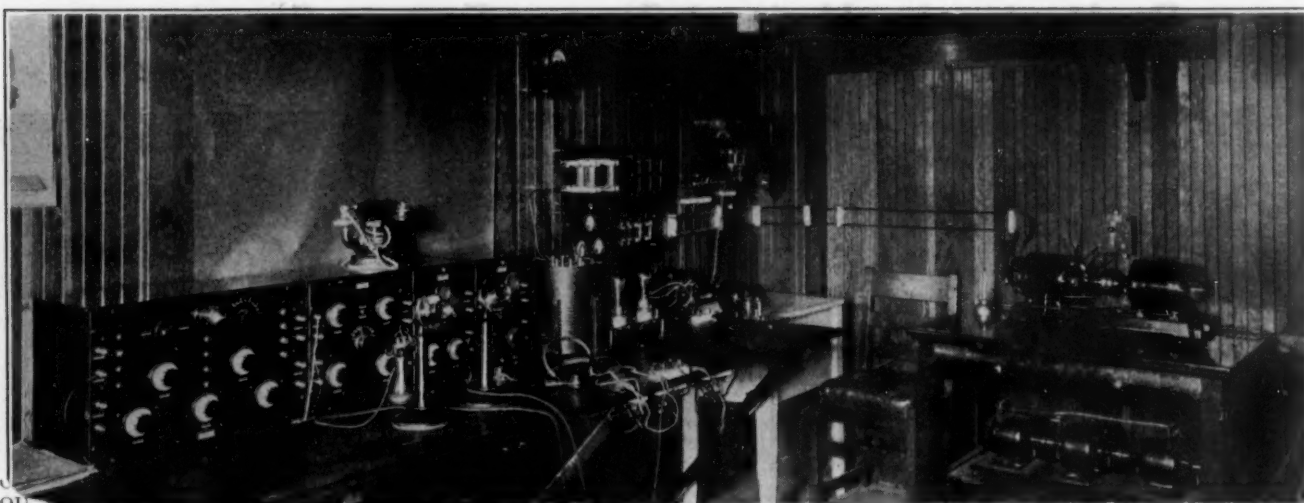
#### CALL LIST OMISSIONS

The list of Pacific Coast amateur stations in our September issue did not contain the name and address of station 6AQQ. In order to complete last month's list our readers should include the following: 6AQQ, A. H. Furst, 843 East Central Ave., Redlands, Cal.

### Sixth District Amateur Stations

Call	Name—	Address—
6ASN	D. Koch	2043 Berryman Street, Berkeley, Cal.
6ASO	J. P. Hickey	149 Sixth Avenue, San Francisco, Cal.
6ASP	C. F. Lard	5815 Ayala Street, Oakland, Cal.
6ASQ	F. J. McLung	302 South Rugby St., Huntington Park, Cal.
6ASR	Wan Chan Chock	Beretania St., Honolulu, T. H.
6AST	R. F. Legge	3016 Benvenue Avenue, Berkeley, Cal.
6ASU	E. Sibbett	13 Parkside Drive, Alameda, Cal.
6ASV	D. G. Chilson	Tucson, Ariz.
6ASW	I. Coffey	Gonzales, Cal.
6ASX	A. W. Williford	3265 Central Avenue, Alameda, Cal.
6ASY	R. H. Plimpton	2508½ Palm Drive, Los Angeles, Cal.
6ASZ	E. S. Graham	1189 Dolores Street, San Francisco, Cal.
6ATA	A. & L. Newman	1700 Sonoma Ave., Berkeley, Cal. (Portable.)
6ATB	P. Langrick	510 North Lake Street, Los Angeles, Cal.
6ATC	K. W. Kent	53 Hernandez Avenue, Los Gatos, Cal.
6ATD	J. R. Casey	Auburn, Cal.
6ATE	H. Adams	1238 S. Ninth East St., Salt Lake City, Utah.
6ATF	W. B. Bruce	139 South Walnut Street, Brea, Cal.
6ATG	R. Robinson	520 Rose Avenue, Long Beach, Cal.
6ATI	M. E. Johnson	1 East Second St., Ephraim, Utah.
6ATJ	A. Watson	1204 H Street, Eureka, Cal.
6ATK	F. Nickson Jr.	416 Sixth Street, Petaluma, Cal.
6ATL	H. Hammerly	529 Merrinac St., San Francisco. (Portable.)
6ATM	H. L. McIntosh	312 East Mill Street, Santa Maria, Cal.
6ATN	D. Lakes	137 Richards Street, Fallon, Nev.
6ATO	M. E. Stuart	Fallon, Nev.
	E. G. Bowman & T. F. Holmes	Thacher School, Ojai, Calif.
6ATP	O. White	Nogales, Ariz.
6ATQ	H. A. Wall	Mt. Pleasant, Utah.
6ATR	C. Urquhart	403 E St., Eureka, Calif.
6ATS	R. Fludge	19th Ave. & Sloat Blvd., San Francisco.
6ATT	Pomona Flx. & Wlr. Co.	Pomona, Calif.
6ATU	C. Henninger	R. F. D. 1-4-215-J, Oakland, Calif.
6ATV	John Utschig	1468 Ninth Ave., San Francisco.
6ATW	J. Ellassen	317 Ramona Ave., Berkeley, Calif.
6ATX	H. C. Gregory	Vendime Ave., Daly City, Calif.
6ATY	T. L. Graham	1189 Dolores St., San Francisco.
6ATZ	G. Evans	3042 Delaware St., Oakland, Calif.
6AUA	L. Ziegler	4601 Pasadena Ave., Los Angeles, Calif.
6AUB	H. Compton	3369 28th St., San Diego, Calif.
6AUC	H. Hostetter	3754 Oregon St., San Diego, Calif.
6AUD	J. Elmer	2020 Monroe Ave., San Diego, Calif.
6AUE	M. D. Ball	1168 22nd St., San Diego, Calif.
6AUF	J. F. Thomas	St. Joseph High School, San Jose, Calif.
6AUG	H. Vettel	Hornbrook, Calif.
6AUH	D. Bergstedt	Magnolia Ave., Pasadena, Calif.
6AUJ	F. W. Robinson	903 Pine St., Oroville, Calif.
6AUJ	P. Peterson	1213 E. Wash. St., Phoenix, Ariz.
6AUK	A. Burley	Newcastle, Calif.
6AUL	H. O. DeLa Montanya	2830 11th Ave., Oakland, Calif.
6AUM	C. H. Romander	Smith River, Calif.
6AUN	C. A. Messineo	1730 Page St., San Francisco.
6AUO	J. J. Wallace	831 Sacramento St., Vallejo, Calif.
6AUP	J. F. Brady	2012 Pacific St., Alameda, Calif.
6AUQ	R. M. Heintz	653 Miramar Ave., San Francisco.
6AUR	W. A. Carlson	1710 34th Ave., Oakland, Calif.
6AUS	E. E. Vetter	912 Persia Ave., San Francisco.
6AUT	R. E. Esparza	1915 Lincoln Ave., Alameda, Calif.
6AUU	H. A. Tattenham	316 Richland Ave., San Francisco.
6AUV	E. T. Cole	116 Florida St., Vallejo, Calif.
6AUW	R. Ghidella	2051 Leavenworth St., San Francisco.
6AUX	R. H. Hanlon	437 Walnut St., San Francisco.
6AUZ	R. Moore	2612 Buena Vista Ave., Alameda, Calif.
6AVA	E. M. Hall	931 61st St., Oakland, Calif.
6AVB	G. Deaner	154 J St., Tulare, Calif.
6AVC	C. A. Pearson	2323 F St., Sacramento, Calif.
6AVD	J. M. Boyd	Twelfth & Market Sts., Oakland, Calif.
6AVE	J. R. Alsip	R. F. D. No. 3, Box 735, Watts, Calif.
6AVF	J. C. Graner	1121 Santa Clara St., Vallejo, Calif.
6AVG	J. H. Hadley	1190 Jackson St., San Francisco.
6AVH	R. Winenow	269 Richland Ave., San Francisco.
6AVI	R. Richardson	4358 Foothill Blvd., Oakland, Calif.
6AVJ	L. C. Cole	753 E. Third St., Los Angeles, Calif.
6AVK	M. S. Wood	483 L St., Dinuba, Calif.
6AVL	H. V. Rugh Jr.	2425 Alhambra Ave., Alhambra, Calif.
6AVM	F. L. Walker Jr.	Westwood, Lassen Co., Calif.
6AVN	R. Zimmerman	Capay, Calif.
6AVO	T. Shaw	150 W. Third St., Claremont, Calif.
6AVP	B. McMahon	Compton, Calif.
6AVQ	E. E. Barnett	548 W. Sixth St., Long Beach, Calif.
6AVR	H. Knagh	250 Thrift St., San Francisco.
6AVS	C. Yates	R. F. D. No. 3, Box 104A, Fullerton, Calif.
6AVT	H. Norek	506 Orange Ave., Long Beach, Calif.
6AVU	H. Frame	2533 Brant St., San Diego, Calif.
6AVV	K. Lambkin	114 Bonito Court, Ontario, Calif.
6AVW	M. Ports	3265 Belmont St., Fresno, Calif.
6AVX	R. Garcia	1003 N. Coronado St., Los Angeles, Calif.
6AVY	G. G. Monck	2330 Third St., San Diego, Calif.
6AVZ	L. P. Simpson	1040 W. 51st Place, Los Angeles, Calif.
6AWA	W. J. Edwards	2221 Hunt St., Monterey, Calif.
6AWB	P. H. Adams	756 E Avenue, Coronado, Calif.
6AWC	J. H. Smith	320 Milford St., Glendale, Calif.
6AWD	G. C. Callender	139 Jessie St., Manteca, Calif.
6AWE	E. Owen	2302 Garfield St., Monterey Park, Calif.
6AWF	H. C. Rider	933 N. Harvard Blvd., Los Angeles, Calif.
6AWG	A. Chamberlain	106 W. Third St., Los Angeles, Calif.
6AWH	R. Squire	39 Granada St., San Francisco.
6AWI	E. J. Seely	540 So. 9th East St., Salt Lake City, Utah.
6AWJ	N. S. Beesley	1917 Raymond Ave., Los Angeles, Calif.
6AWK	S. W. Lohman	4408 Santa Monica Blvd., Los Angeles, Calif.
6AWL	B. Fredenthal	527 Euclid Ave., Ontario, Calif.
6AWM	W. Weitman	2424 Sixth Ave., Los Angeles, Calif.
6AWN	F. W. Wood	1418 Malvern St., Los Angeles, Calif.
6AWO	A. E. Moorhead Jr.	284 Perkins St., Oakland, Calif.
6AWP	W. Phillips	905 York St., Vallejo, Calif.
6AWQ	E. Thacher	407 W. First St., Santa Ana, Calif.
6AWR	F. W. Hadley	San Simeon, Calif.
6AWS	D. G. Hewitt	Box 596, Stanford University, Calif.
6AWT	H. D. Schmidt	383 Ocean Ave., Santa Cruz, Calif.
6AWU	B. Molinari	653 Union St., San Francisco, Calif.
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S. W. Ostrom  
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H. M. Reynolds  
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Alva Flippin  
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Chris Engleman Jr.  
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E. W. Henry  
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F. R. Cartan  
John Munzenrieder  
Jay Isham  
F. A. Kochler  
Victor Chambers  
D. W. Cathcart  
M. A. Hauge  
R. G. Farrah  
Barton Stanler  
Charles Parmelee  
N. H. Foster  
H. E. Nelson  
E. J. Hoff  
P. E. Nolte  
John Soderstrom  
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Kenneth Paton  
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D. E. Renkole  
Jeffery Klichli  
L. E. Scriven  
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2818 Victor Place, Everett, Wash.  
2019 Nob Hill, Seattle, Wash.  
R. A. Box 292A, Eugene, Ore.  
115 First St., Wolf Point, Mont.  
288 Eighth St., Marshfield, Ore.  
Second Ave., Glasgow, Mont.  
305 Fifth St. S., Glasgow, Mont.  
4324 8th Ave. N. E., Seattle, Wash.  
8523 12th Ave. N. W., Seattle, Wash.  
907 W. 58th St., Seattle, Wash.  
First and E St., Tacoma, Wash.  
1120 N 97th St., Seattle, Wash.  
3232 38th Ave. S. W., Seattle, Wash.  
2802 22nd Ave., Seattle, Wash.  
529 Third St., Helena, Mont.  
R. F. D. No. 2, Powell, Wyo.  
434 17th St., Corvallis, Ore.  
Puyallup, Wash.  
Powel, Wyo.  
Nampa, Idaho.  
Carneyville, Wyo.  
120 E. 60th St., Seattle, Wash.  
306 E. Olive St., Seattle, Wash.  
1907 1st Ave. W., Seattle, Wash.  
1015 Spur St., Aberdeen, Wash.  
4608 J St., Tacoma, Wash.  
4840 48th St. S. E., Portland, Ore.  
1951 Third Ave. W., Seattle, Wash.  
3817 Denamore Ave., Seattle, Wash.  
1315 Sandy Blvd., Portland, Ore.  
Powell, Wyo.  
Eastonville, Wash.  
Rainier, Ore.  
1005 N. Normandie St., Spokane, Wash.  
620 21st Ave. N., Seattle, Wash.  
1622 Mellrose Ave., Seattle, Wash.  
204 N. 22nd St., Portland, Ore.  
321 W. 32nd St., Vancouver, Wash.  
Myrtle Point, Ore.  
5505 36th Ave. S. E., Portland, Ore.  
1514 Willamette St., Eugene, Ore.  
1461 Monroe St., Corvallis, Ore.  
515 First St., Helena, Mont.  
820 Dalton Ave. W., Spokane, Wash.  
314 S. 12th St., Corvallis, Ore.  
Nineteenth St., Cottage Grove, Ore.  
1505 E. 66th St., Portland, Ore.  
5635 11th Ave. N. E., Seattle, Wash.  
700 E. 26th St., Vancouver, Wash.  
Spruce St., Myrtle Point, Ore.  
Sunnyside, Wash.  
N. Water St., Ellensburg, Wash.  
Centralia, Wash.  
927 Irving St., Astoria, Ore.  
Camp Lewis, Wash.  
823 Thornton St., Aberdeen, Wash.  
2443 Fifth Ave. W., Seattle, Wash.  
1123 Burwell St., Bremerton, Wash.  
1366 31st Ave. S., Seattle, Wash.  
9260 California Ave., Seattle, Wash.  
Cashmere, Wash.  
439 E. 10th St. N., Portland, Ore.  
1004 Leonard St., Portland, Ore.  
Cashmere, Wash.  
319 N. 33rd St., Billings, Mont.  
2118 Lingerwood St., Spokane, Wash.  
2815 Pacific Ave., Hoquiam, Wash.  
744 Kearny St., Portland, Ore.  
6523 45th Ave. S. E., Portland, Ore.  
2423 Birch St., Astoria, Ore.  
Box 21, R. F. D. No. 1, Salem, Ore.  
Owyhee St., Ontario, Ore.  
323 N. Conant Ave., Burley, Idaho.

Then 6AJH exchanged greetings with 7ZJ through heavy atmospherics. The San Diego arc spoiled the fine work of the morning hours.

While writing you this letter, I am listening to 6MH working with 7ZJ and they don't seem to be having much of a hard time in doing so. In this case the distance is another 900 miles and I hear two other fellows working at the same time, all of which goes to show that much work is being accomplished during the early morning hours.

All of the stations mentioned above are spark equipped. I am situated just half way between these stations and have, therefore, a fine chance to get an idea of what is going on from all directions.

Respectfully,

(Signed) J. W. WISE, 6ZX.

310 West 14th Street,  
New York City,  
Sept. 1, 1921.

Editor "Pacific Radio News,"  
Pacific Radio Publishing Co.,  
San Francisco.

My Dear Editor:

I read with much interest an article by Mr. Carl E. Soderstrom in the September issue of P.R.N., in which he states his views concerning private apparatus aboard merchant vessels. I heartily agree with Mr. Soderstrom in some of his views, but on the other hand I believe it is an injustice to the operators en masse, that some should use or be permitted to use a sensitive detector and amplifier (vacuum tubes) while others dare not, owing to existing regulations.

I understand that the shipping board permits the use of vacuum tubes, and I know that various foreign vessels are using vacuum tubes in their regular equipment. I consider it unfair to those who must use the regular equipment, that is, crystal detectors, although the latter can get traffic through just as well with a little more patience.

In this connection I would like to call Mr. Soderstrom's attention to his letter of October 8, 1920, printed on page 81 of the November, 1920, issue of P.R.N., in which he reports hearing San Diego press 4,000 miles in daylight and Annapolis and Balboa while at London, using a Kennedy Long Wave Receiver outfit with one audiotron bulb. If the above performances don't contradict every reason Mr. Soderstrom gave for not using private apparatus aboard merchant vessels, I'd like to know—"How Come?"

Yours very truly,

(Signed) MONTE COHEN.

SEIZED, during the war, by the navy department, may be returned to the owner, upon application to the District Communication Superintendent, of the Naval District in which the seizure was made although it is believed that most of this apparatus is already in the hands of its proper owners.

**Q.—I have a small radio telephone set. Can I play music for the benefit of other amateurs? (A. M. B., San Francisco.)**

**Ans.** No. Concerts must only be sent out by certain stations designated for that purpose by the Radio Inspector, at designated times. If anyone was allowed to send them out promiscuously, it would cause endless interference, and trouble, as well as monopolization of the "circuit" by one party to the exclusion of all others.

### EXAMINATION FOR RADIO INSPECTOR

The United States Civil Service Commission announces an open competitive examination for radio inspector on October 5, 1921. Vacancies in the positions of radio inspector and assistant radio inspector in the Bureau of Navigation, Department of Commerce, at \$1,800 to \$2,200 a year, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The duties will be primarily to inspect the radio apparatus on steamships, to insure its compliance with the law, and to inspect shore stations. The inspectors may also be called upon to examine radio operators. The duties of radio inspectors require some office experience, therefore competitors should outline fully in their applications any office experience they may have had. Competitors will be examined on theoretical and practical questions in the construction, use, and adjustment of radio apparatus and auxiliaries (rating of 50) and education and experience in the line of the required duties (rating of 50).

Applicants must have received a bachelor of science degree from a school of recognized standing, such educational training to have included a special course in radio or kindred sciences, or show that they are senior students in such institutions; or have had the equivalent of a high school education and at least two years' experience in special radio work, such as the manufacture, installation, or adjustment of commercial or governmental wireless apparatus. It is essential that applicants be wireless telegraph operators.

Applicants must have reached their twenty-first but not their fiftieth birthday on the date of the examination. These age limits do not apply to persons entitled to preference because of military or naval service.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C., or to the Secretary of the United States Civil Service Board at any place listed hereon. Applications should be properly executed, excluding the medical and county officer's certificates, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant.

### CALL LIST OMISSIONS

The list of Pacific Coast amateur stations in our September issue did not contain the name and address of station 6AQQ. In order to complete last month's list our readers should include the following: 6AQQ, A. H. Furst, 843 East Central Ave., Redlands, Cal.

### Sixth District Amateur Stations

Call	Name—	Address—
6ASN	D. Koch	2043 Berryman Street, Berkeley, Cal.
6ASO	J. P. Hickey	149 Sixth Avenue, San Francisco, Cal.
6ASP	C. F. Lard	5815 Ayala Street, Oakland, Cal.
6ASQ	F. J. McLung	302 South Rugby St., Huntington Park, Cal.
6ASR	Wan Chan Chock	Beretania St., Honolulu, T. H.
6AST	R. F. Legge	3016 Benvenue Avenue, Berkeley, Cal.
6ASU	E. Sibbett	13 Parkside Drive, Alameda, Cal.
6ASV	D. G. Chilson	Tucson, Ariz.
6ASW	I. Coffey	Gonzales, Cal.
6ASX	A. W. Williford	3265 Central Avenue, Alameda, Cal.
6ASY	R. H. Plimpton	2508 1/2 Palm Drive, Los Angeles, Cal.
6ASZ	E. S. Graham	1189 Dolores Street, San Francisco, Cal.
6ATA	A. & L. Newman	1700 Sonoma Ave., Berkeley, Cal. (Portable.)
6ATB	P. Langrick	510 North Lake Street, Los Angeles, Cal.
6ATC	K. W. Kent	53 Hernandez Avenue, Los Gatos, Cal.
6ATD	J. R. Casey	Auburn, Cal.
6ATE	H. Adams	1238 S. Ninth East St., Salt Lake City, Utah.
6ATF	W. B. Bruce	139 South Walnut Street, Brea, Cal.
6ATG	R. Robinson	520 Rose Avenue, Long Beach, Cal.
6ATI	M. E. Johnson	1 East Second St., Ephraim, Utah.
6ATJ	A. Watson	1204 H Street, Eureka, Cal.
6ATK	F. Nickson Jr.	416 Sixth Street, Petaluma, Cal.
6ATL	H. Hammerly	529 Merrinac St., San Francisco. (Portable.)
6ATM	H. L. McIntosh	312 East Mill Street, Santa Maria, Cal.
6ATN	D. Likes	137 Richards Street, Fallon, Nev.
6ATO	M. E. Stuart	Fallon, Nev.
	E. G. Bowman & T. P. Holmes	Thacher School, Ojai, Calif.
6ATP	O. White	Nogales, Ariz.
6ATQ	H. A. Wall	Mt. Pleasant, Utah.
6ATR	C. Urquhart	403 E St., Eureka, Calif.
6ATS	R. Fludge	19th Ave. & Sloat Blvd., San Francisco.
6ATT	Pomona Flx. & Wir. Co.	Pomona, Calif.
6ATU	C. Henninger	R. F. D. 1-4-215-J, Oakland, Calif.
6ATV	John Utschig	1468 Ninth Ave., San Francisco.
6ATW	J. Ellassen	317 Ramona Ave., Berkeley, Calif.
6ATX	H. C. Gregory	Vendime Ave., Daly City, Calif.
6ATY	T. L. Graham	1189 Dolores St., San Francisco.
6ATZ	G. Evans	3042 Delaware St., Oakland, Calif.
6AUA	L. Ziegler	4601 Pasadena Ave., Los Angeles, Calif.
6AUB	H. Compton	3369 28th St., San Diego, Calif.
6AUC	H. Hostetter	3754 Oregon St., San Diego, Calif.
6AUD	J. Elmer	2020 Monroe Ave., San Diego, Calif.
6AUE	M. D. Ball	1168 22nd St., San Diego, Calif.
6AUF	J. F. Thomas	St. Joseph High School, San Jose, Calif.
6AUG	H. Vettel	Hornbrook, Calif.
6AUH	D. Bergstedt	Magnolia Ave., Pasadena, Calif.
6AUI	F. W. Robinson	903 Pine St., Oroville, Calif.
6AUJ	P. Peterson	1213 E. Wash. St., Phoenix, Ariz.
6AUK	A. Burley	Newcastle, Calif.
6AUL	H. O. DeLa Montanya	2830 11th Ave., Oakland, Calif.
6AUM	C. H. Romander	Smith River, Calif.
6AUN	C. A. Messineo	1730 Page St., San Francisco.
6AUO	J. J. Wallace	831 Sacramento St., Vallejo, Calif.
6AUP	J. F. Brady	2012 Pacific St., Alameda, Calif.
6AUQ	R. M. Heintz	653 Miramar Ave., San Francisco.
6AUR	W. A. Carlson	1710 34th Ave., Oakland, Calif.
6AUS	E. E. Vetter	912 Persia Ave., San Francisco.
6AUT	R. E. Esparza	1915 Lincoln Ave., Alameda, Calif.
6AUU	H. A. Tattenham	316 Richland Ave., San Francisco.
6AUV	E. T. Cole	116 Florida St., Vallejo, Calif.
6AUW	R. Ghidella	2051 Leavenworth St., San Francisco.
6AUX	R. H. Hanlon	437 Walnut St., San Francisco.
6AUZ	R. Moore	2612 Buena Vista Ave., Alameda, Calif.
6AVA	E. M. Hall	931 61st St., Oakland, Calif.
6AVB	G. Deane	154 J St., Tulare, Calif.
6AVC	C. A. Pearson	2323 F St., Sacramento, Calif.
6AVD	J. M. Boyd	Twelfth & Market Sts., Oakland, Calif.
6AVE	J. R. Alsip	R. F. D. No. 3, Box 735, Watts, Calif.
6AVF	J. C. Graner	1121 Santa Clara St., Vallejo, Calif.
6AVG	J. H. Hadley	1190 Jackson St., San Francisco.
6AVH	R. Winenow	269 Richland Ave., San Francisco.
6AVI	R. Richardson	4358 Foothill Blvd., Oakland, Calif.
6AVJ	L. C. Cole	753 E. Third St., Los Angeles, Calif.
6AVK	M. S. Wood	483 L St., Dinuba, Calif.
6AVL	H. V. Rugh Jr.	2425 Alhambra Ave., Alhambra, Calif.
6AVM	F. L. Walker Jr.	Westwood, Lassen Co., Calif.
6AVN	R. Zimmerman	Capay, Calif.
6AVO	T. Shaw	150 W. Third St., Claremont, Calif.
6AVP	B. McMahon	Compton, Calif.
6AVQ	E. E. Barnett	548 W. Sixth St., Long Beach, Calif.
6AVR	H. Knagh	250 Thrift St., San Francisco.
6AVS	C. Yates	R. F. D. No. 3, Box 104A, Fullerton, Calif.
6AVT	H. Norek	506 Orange Ave., Long Beach, Calif.
6AVU	H. Frame	2533 Brant St., San Diego, Calif.
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306 E. Olive St., Seattle, Wash.  
1907 1st Ave. W., Seattle, Wash.  
1015 Spur St., Aberdeen, Wash.  
4608 J St., Tacoma, Wash.  
4840 48th St. S. E., Portland, Ore.  
1951 Third Ave. W., Seattle, Wash.  
3817 Densmore Ave., Seattle, Wash.  
1315 Sandy Blvd., Portland, Ore.  
Powell, Wyo.  
Eastonville, Wash.  
Rainier, Ore.  
1005 N. Normandie St., Spokane, Wash.  
620 21st Ave. N., Seattle, Wash.  
1622 Melrose Ave., Seattle, Wash.  
204 N. 22nd St., Portland, Ore.  
321 W. 32nd St., Vancouver, Wash.  
Myrtle Point, Ore.  
5505 36th Ave. S. E., Portland, Ore.  
1514 Willamette St., Eugene, Ore.  
1461 Monroe St., Corvallis, Ore.  
515 First St., Helena, Mont.  
820 Dalton Ave. W., Spokane, Wash.  
314 S. 12th St., Corvallis, Ore.  
Nineteenth St., Cottage Grove, Ore.  
1505 E. 66th St., Portland, Ore.  
5635 11th Ave. N. E., Seattle, Wash.  
700 E. 26th St., Vancouver, Wash.  
Spruce St., Myrtle Point, Ore.  
Sunnyside, Wash.  
N. Water St., Ellensburg, Wash.  
Centralla, Wash.  
927 Irving St., Astoria, Ore.  
Camp Lewis, Wash.  
823 Thornton St., Aberdeen, Wash.  
2443 Fifth Ave. W., Seattle, Wash.  
1123 Burwell St., Bremerton, Wash.  
1366 31st Ave. S., Seattle, Wash.  
9260 California Ave., Seattle, Wash.  
Cashmere, Wash.  
439 E. 10th St. N., Portland, Ore.  
1004 Leonard St., Portland, Ore.  
Cashmere, Wash.  
319 N. 33rd St., Billings, Mont.  
2118 Lingerwood St., Spokane, Wash.  
2815 Pacific Ave., Hoquiam, Wash.  
744 Kearny St., Portland, Ore.  
6523 45th Ave. S. E., Portland, Ore.  
2423 Birch St., Astoria, Ore.  
Box 21, R. F. D. No. 1, Salem, Ore.  
Owyhee St., Ontario, Ore.  
323 N. Conant Ave., Burley, Idaho.

Then 6AJH exchanged greetings with 7ZJ through heavy atmospherics. The San Diego arc spoiled the fine work of the morning hours.

While writing you this letter, I am listening to 6MH working with 7ZJ and they don't seem to be having much of a hard time in doing so. In this case the distance is another 900 miles and I hear two other fellows working at the same time, all of which goes to show that much work is being accomplished during the early morning hours.

All of the stations mentioned above are spark equipped. I am situated just half way between these stations and have, therefore, a fine chance to get an idea of what is going on from all directions.

Respectfully,

(Signed) J. W. WISE, 6ZX.

310 West 14th Street,  
New York City,  
Sept. 1, 1921.

Editor "Pacific Radio News,"  
Pacific Radio Publishing Co.,  
San Francisco.

My Dear Editor:

I read with much interest an article by Mr. Carl E. Soderstrom in the September issue of P.R.N., in which he states his views concerning private apparatus aboard merchant vessels. I heartily agree with Mr. Soderstrom in some of his views, but on the other hand I believe it is an injustice to the operators in large, that some should use or be permitted to use a sensitive detector and amplifier (vacuum tubes) while others dare not, owing to existing regulations.

I understand that the shipping board permits the use of vacuum tubes, and I know that various foreign vessels are using vacuum tubes in their regular equipment. I consider it unfair to those who must use the regular equipment, that is, crystal detectors, although the latter can get traffic through just as well with a little more patience.

In this connection I would like to call Mr. Soderstrom's attention to his letter of October 8, 1920, printed on page 81 of the November, 1920, issue of P.R.N., in which he reports hearing San Diego press 4,000 miles in daylight and Annapolis and Balboa while at London, using a Kennedy Long Wave Receiver outfit with one audiotron bulb. If the above performances don't contradict every reason Mr. Soderstrom gave for not using private apparatus aboard merchant vessels, I'd like to know—"How Come?"

Yours very truly,

(Signed) MONTE COHEN.

### RADIO TELEPHONE SHOP CONCERT SET

Every Tuesday and Friday night from 8 to 9 you have heard the radio telephone concerts broadcasted from the Radio Telephone Shop in San Francisco, but you have never had the "inside dope" of 6UV. The picture tells the whole tale. The more you look at it the more you will learn about the "TRTS" station.

Mr. A. F. Pendleton, proprietor of the Radio Telephone Shop, personally operates the station twice weekly for the benefit of the many hundreds of "listening-in" radio fans along the Pacific Coast. Radio concerts, exclusively, are broadcasted on 425 meters and reports of the reception of music have been reported from stations as far north as Seattle, Wash. Ships at sea have heard Mr. Pendleton's voice while 800 miles from San Francisco.

The main radio transmitter panel can be seen to the left of the picture. Four power tubes of the 5-watt size are used. The antenna for radio telephone transmission is hardly 50 feet above the ground. To the right of the telephone transmitter panel is the receiving equipment. The two units are of the Pen Brand Type A detector and two stages of amplification are used for receiving purposes. The Magnavox does the rest. A Columbia phonograph and a generous supply of the latest records were loaned to the Radio Telephone Shop for the musical program.

Mr. Pendleton is one of the radio telephone pioneers of the West. His first telephone made its debut on the air about

a year and a half ago. At that time radio concerts were a distinct novelty and to Mr. Pendleton goes much of the credit of being the "founder" of the local air concerts.

The station is specially licensed by the Department of Commerce for experimental work. It is located close to the San Francisco water front, on Steuart Street. Several of the large commercial radio companies have branch offices on that same street and this familiar by-way of the commercial operators has taken on the nickname of "Radio Row."

### NORTHWESTERN C.W. STATION WORKS ALASKA ON ONE TUBE

The following letter is from Nelson Lagoon, Alaska. It was sent to 7OZ, telling him of the fine work that he is doing with his C.W. set, using only one 5-watt bulb and A.C. for the plate voltage.

Nelson Lagoon, Alaska, July 6, 1921.

Garrett Lewis,  
Radio 7OZ,

Dear Friend Lewis:

It would probably interest you to know that your C.W. signals were heard with good audibility at Libbyville, up in Bristol Bay, Alaska.

John Hertz, old 7ZB, was the boy who heard you. He did not make notation of the exact date, but it was about the 11th of June. He also has heard 7BX's spark, as well as several "six" stations.

73 and C. U. L.

(Signed) RALPH WILLISON, 7BP.

### 7YA—BOISE, IDAHO

We have often wondered what 7YA looks like, as we all have heard him. Here's all the important dope, including photos, of the Boise station that is mentioned on the air almost every night from one end of the coast to the other.

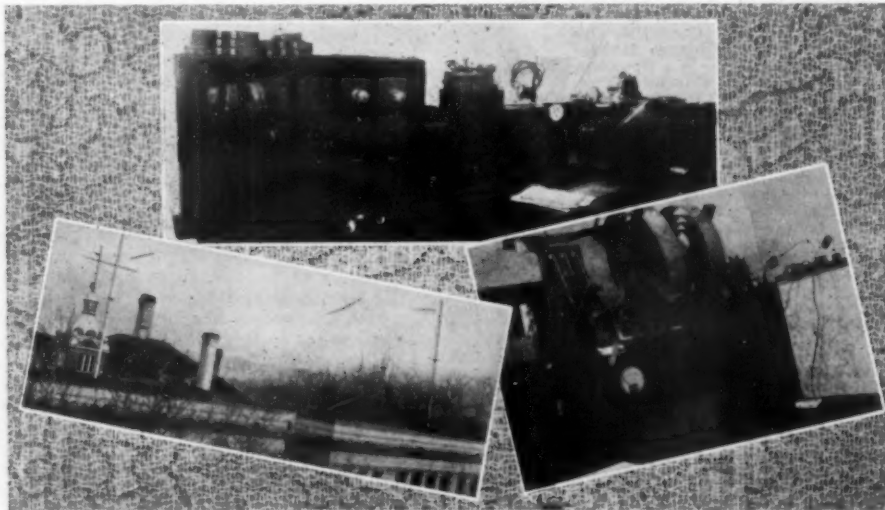
7YA is located in the Boise High School and has been shut down at times during the summer vacation. More than 100 cards were received during January from various stations hearing 7YA—so many, in fact, that H. E. Redeker, the station operator, experienced difficulty in answering them all. Mr. Redeker is an instructor at the school and is assisted in the work of the station by E. O. Selby, a student operator.

The aerial is clearly shown in one of the photos. Two masts, 45 feet high, mounted on the roof of the school, suspend an aerial 125 feet long. Another aerial about 115 feet long of the inverted L type is also used. The lead-in is a length of No. 4 copper wire, 55 feet long. Four No. 10 insulated copper wires soldered to the water pipes in the building are used for the grounding system.

These pipes lie directly under the aerial and act somewhat like a counterpoise. The fundamental wave length of the transmitting aerial is 375 meters. A 2 k.w. oil-immersed transformer, closed core magnetic leakage type, formerly used by H. A. Rawson of Kuna, Idaho, is responsible for the QSA juice that 7YA shoots into the air. The transformer was built by the General Electric Company according to Mr. Rawson's specifications. The condenser is also oil-immersed. It has 6 x 8-inch copper plates, each plate being separated by three sheets of 8 x 10-inch photographic glass.

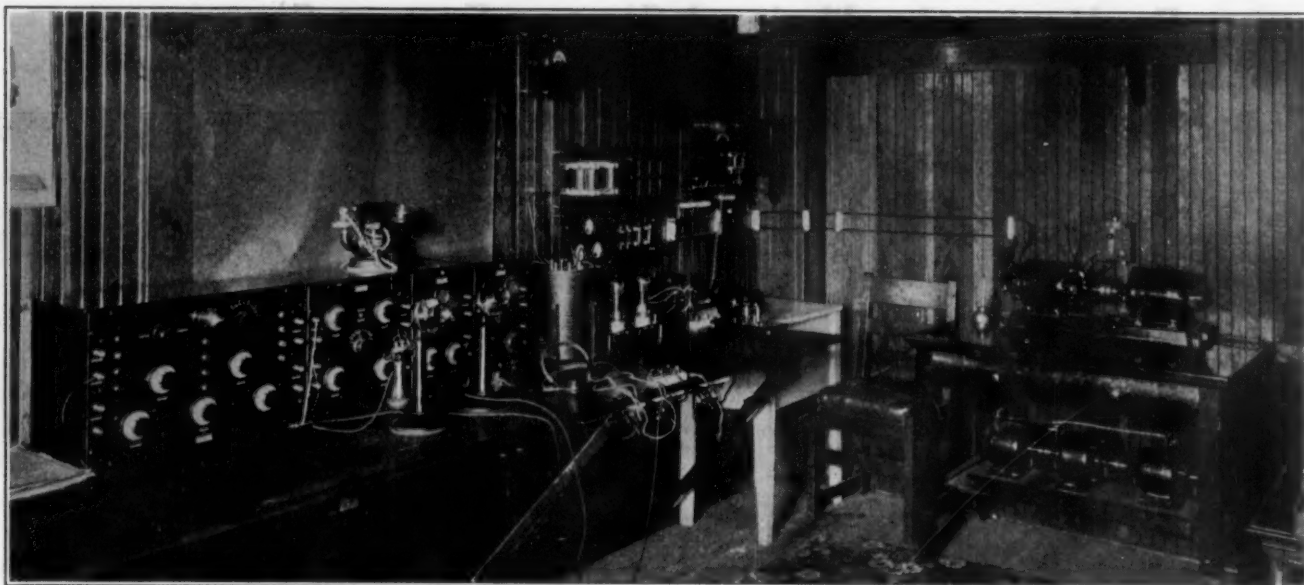
The gap is the heavy Meteor type, provided with variable speed control. The O.T. is a "DX-52" with 3-inch copper ribbon on both the primary and secondary windings. The radiation on 1 k.w. is almost 7½ amps, according to readings obtained from a Jewell thermo-coupler ammeter. A DeForest unit panel receiver was used throughout the last season.

The greatest official working distance of 7YA is with 9NJ, Ames, Iowa. Signals have also been heard at Madison, Wis., and with generally good audibility within a radius of 1000 miles. A station at Riverside, Cal., reports signals from 7YA strong on a crystal detector and a ship station stated that 7YA could be heard "all over the cabin" while the vessel was more than 1000 miles northwest of Seattle.



7YA—Boise, Idaho.





Kennedy Telephone Station at Los Altos.

### KENNEDY RADIO TELEPHONE TRANSMITTING STATION

Among the radio telephone installations on the Pacific Coast, that of the Colin B. Kennedy Company of San Francisco has been exciting a great amount of interest and comment, due both to its excellent modulation and to the distances over which transmission has been successfully achieved.

The Kennedy experimental station, whose call is 6XAC, is at Los Altos, about 40 miles south of San Francisco on the peninsula and on the inland side of the coast range. The installation is at the home of Emile A. Portal of that company, who is responsible for the operation of the station.

The photograph which is reproduced herewith shows the interior of 6XAC with the exception of the phonograph used for transmitting music, which is at the right. The receiving equipment is shown at the left and consists of the following old-type Kennedy units, a Type 100 long wave receiver, a Type 200 short wave receiver, a Type 300 audion control panel, and a Type 520 two-stage amplifier. Mr. Portal states that he expects to replace all of this in the near future with two of the new receiving units recently developed by his company—a Type 110 universal receiver and a Type 525 two-stage amplifier. A Magnavox and two-stage Magnavox power amplifier complete the receiving equipment with which Mr. Portal has at various times entertained his neighbors within a radius of from three to four miles, as previously recorded in these columns.

The transmitting equipment, as is indicated by the picture, is extremely simple. Two 50-watt Cunningham tubes are used, one as modulator, the other as oscillator. The filaments are heated by current drawn directly from the 10-volt secondary of a 60-cycle transformer having a neutral point. The plate current is supplied by the 1000-volt generator of the 275-watt motor generator outfit shown on the table at the right. Double choke coils and fixed condensers are used in smoothing out the commutator ripple. A modulation transformer of special design is employed in connection with a high duty telephone transmitter for voice and a Magnavox tone arm transmitter for the music. The necessary meters are mounted conveniently on panels for the

observation of the different variable quantities of voltage and current. The normal radiation of the station is three amperes.

The circuits and constants used are developments of the Kennedy laboratory and will be made public at a later date.

The antenna used for transmitting is of the cage type 55 feet long and about 100 feet high. Two other single wire antennas are available for reception when desired.

6XAC transmits music three times a week, on Monday and Thursday evenings between 8 and 9 o'clock, and on Sunday afternoons from 3 to 4. The wave length is 430 meters.

In the short time that this station has been operating some very interesting reports of its reception have been received. Excellent reception on a single tube has been reported from all parts of California, Oregon and Washington, and from various points in British Columbia, Idaho and Nevada. The latest to report is Great Falls, Montana, with a single tube! Some almost unbelievable reports have been received of reception with very poor antennas. Judging from the splendid work accomplished by this telephone at the time of year it has been operating, we look forward to exceptional results during the coming static-free season.

### RADIO STATION 6DD—GRASS VALLEY, CAL.

"It works as good as it looks," says Mr. Phil Keast, referring to the accompanying illustration of his cleverly arranged station. A Radio Shop regenerative receiver with a three step amplifier

and a Magnavox comprise the essential parts of the receiving equipment. A 5-watt power tube is used for the third step of amplification with very good results.

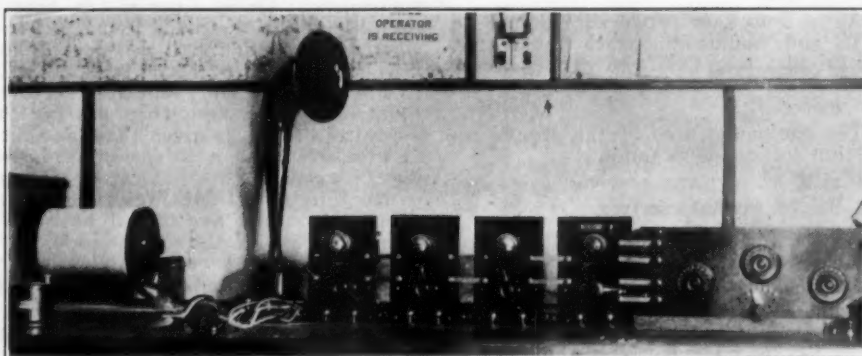
The transmitter consists of an Acme 1-k.w. transformer, synchronous gap, home-made oil condenser with glass plates 1-4 inch thick and a Wesrad oscillation transformer. No especial records have been broken in transmitting, but stations in Idaho have often been raised. With the addition of the synchronous gap 6DD will be able to do still better work.

A radio telephone transmitter, similar to the one used at the Fairmont Hotel, San Francisco, is under construction.

### HOTEL OAKLAND HAS RADIO TELEPHONE

P. D. Allen, formerly radio officer in charge of the U. S. Navy receiving station at Honolulu, T. H., has installed a radio telephone transmitter in the Hotel Oakland, Oakland, California.

Mr. Allen is operating the station in conjunction with the Western Radio School, of which he is the director. Press is sent daily on 325 meters, from 7:15 to 7:30 p. m. Concerts are broadcasted on Tuesday and Friday evenings from 8 to 9 p. m. There are no Sunday concerts. Press matter is supplied by the Oakland Tribune for broadcasting. Mr. Allen is one of the "old timers" of the West in the radio game. He holds an extra first grade radio license, has had a number of years of sea service to his credit and is a "thoroughbred" radio man in every respect.



6DD—Grass Valley, Calif.

## Radio in the United States Forest Service

F. K. Teeter Jr.

Each year thousands upon thousands of dollars of timber are wasted by that ravaging menace, fire, most of which is caused by the carelessness of man. To overcome this terrible waste, congress enacted laws, creating the United States Forest Service, a body formed to protect our forests from fire and to prosecute those who through their carelessness have caused these gigantic losses.

Every means of communication has been used by this department, to aid the cause the telephone, the heliograph, wigwag, and other well known means of signalling, until 1919, when radio was given its chance. The officers of the forest service and United States Army Air Service met together and planned the use of radio and airplanes, for the use of locating fires, for after our late war experience in spotting artillery shots over the line and reporting back by radio, why would it not be just as easy for a plane to fly over the forests and report any fires spotted back to its base. This method was used successfully during 1919 and 1920, and early in 1921 the Forest Service thought that this could be perfected to a greater degree by installing receiving stations at each forest headquarters.

They then appealed to the Air Service for equipment, which was granted, and to the Department of Commerce for the most reliable source of operators, and, as usual, the reply was to make the selection from the amateurs. Mimeographed blanks were then sent to all licensed amateurs, with the request that they fill them out and return to the Mather Aviation Field, at Sacramento, Calif. After these blanks had been returned, fifteen men were selected and the following stations created:

Station.	Wave	Call.	Length.
Sisson .....	SN	350	
Weaverville .....	WE	350	
Alder Springs .....	AL	350	
Mineral .....	ML	350	
Quincy .....	QY	485	
Santa Barbara .....	SB	350	
Orleans .....	OS	350	
Nevada City .....	NY	485	
Placerville .....	PE	485	
Sonora .....	SR	485	
North Fork .....	NK	350	
Hot Springs .....	HS	350	
Los Angeles .....	LA	350	
Yreka .....	YA	350	
Happy Camp .....	HC	350	

You will notice the wave length of some of the stations are different, the reason for that being to prevent any conflict in messages of one patrol with that of another.

At each airplane patrol base there is a C.W. and modulated buzzer transmitter, for broadcasting QST's to various forest stations, same working on 350, 485 and 600 meters.

The equipment used by the ground reception stations is as follows:

- 1 SCR 59, airplane receiver.
- 1 BC 14, crystal receiver.
- 1 SCR 72, 2-stage amplifier.
- 2 pairs, Western Electric phones.

The SCR 59 receiver is designed for usage in a plane, and consists of a straight tuner, tapped off to four contacts, having a condenser in the antenna circuit for fine adjustment and an audion detector and two-stage amplifier; the



The author at his set. During the war Mr. Teeter was president of the San Francisco Radio Club, which he held together during this trying period with but four members.

whole being enclosed in a case 10x12 inches.

The BC 14 is an army field set, being a loose-coupled outfit with a galena detector, and is for emergency use in case of a breakdown in the SCR 59.

The SCR 72 is an army two-stage amplifier, for use with the SCR 59, giving a total of four steps, but as yet I have not used this amplifier because with SCR 59, the signals from the planes when close are of such audibility that it is uncomfortable to allow the phones to remain upon ones' head, and at all times the planes are readable up to 80 miles and then they are about back to their base.

The planes are equipped with 1-8 kw. 500-cycle spark transmitters, consisting of a generator and exciter, driven by a small propeller, a transformer, a mica condenser and inductance, the whole being mounted and enclosed in a torpedo shaped shell, and placed on the running gear of the plane. The only equipment kept in the plane is a key and a radiation ammeter. The antenna consists of a single stranded wire with a lead weight attached to one end, which is known as a fish, from its shape. The use of this fish is to keep the antenna from tangling around the control wires and also give a vertical component to the antenna, in order to overcome a purely directional effect of radiation. Upon landing the antenna is drawn up upon a reel in rear of the observers' seat. The engine of the plane is used for a ground.

I can now see in the minds of the readers, the doubt of efficiency of this arrangement: there only being a transmitter on the planes with no receiver, and a ground station, with a receiver, but no transmitter. Or in other words, how is the observer in the plane going to know whether the ground station is getting him OK or not? To overcome this, if a fire is spotted, it is sent, repeated, repeated 15 minutes later, and when nearing the air patrol base, it is given them and they in turn telephone it to forest headquarters in which the fire is located. On my patrol I have had five fires reported, to date, and on the five fires I have been able to get it OK the first, second, third and last time, and upon inquiring of other ground stations have found that they have done as well as I.

We also use a panel system as another safeguard against inefficiency. These panels are twelve feet long and three feet wide and are placed in a conspicuous

place, in order that planes may readily see them.

All fire messages are sent in code, it being found necessary to use a code in order to save time, as a few minutes may mean whether we have a big fire or a small one. The code adopted being as follows:

### Fire Call—FFF

#### New or Old Fire

New—N. Old—O.

#### Location

T—Township. R—Range. Section S & Subdivision

#### Sizes—S

G—Single Snag. M—Camp fire. R—Sq. Rods. A—Acres.

#### Cover C

T—Timber. B—Brush. O—Open.

X—Burn or Cut Over.

#### Slope—S

L—Level. G—Gentle. S—Steep.

#### Wind Velocity and Direction—W

N—North. S—South. E—East.

W—West.

The patrols carry maps of the territory over which they fly, these maps being divided into townships, ranges, sections, quarter sections, and also show all lookouts, mountains, rivers, railroads and anything which tends to help in the description and location of a fire. Duplicates of these maps are kept at each air patrol base and also at each forest headquarters, and any fires located are marked on these maps with red pins, and after the fire is out a black pin is substituted, so by this means the observers and forest men at all times know what fires are burning and their condition.

The average patrol flies about 400 miles per day, keeping a log of flights and observations.

Each ground operator is required to keep a log, and to mail same together with all copies of messages sent him from the planes. He is also required to keep a pin map and to confirm all fires by telephone, though where some of the stations, such as Sisson, Yreka and North Fork, which have transmitters, same is confirmed by radio, and communication is also kept with outside forest offices.

During 1922 or 1923 both planes and ground stations will be equipped with CW and radio telephone outfits, and then the peak of efficiency will have been reached, though the present system is working very satisfactorily.



## Static Statistics from Everywhere

By Squak McGuff

Hello, "fellers," how's my spark? How do you get me? QRK, QRH, QTC, QRU, QSL, GE. "73," nil, cul, too much QRM, pls, qrx, etc.

Oh, yes, I just received a delayed reply in connection with the balloon contest; i.e. 6CH's station. But first I'll have to go into a few details lest you get entangled with misapprehension. Sgt. Lufkin, who visits frequently at 6CH, noticed the 'fones were cracked. "How come?" he says to 'CH. "I threw them at a party who caused unnecessary QRM," says 'CH.

So now here comes the sequel. The delayed reply says:

"After careful consideration and concentration I am imbued with the idea that the balloon is for safety first. I noticed that when the door is opened the balloon blows to one side and 6CH invariably makes a quick movement as though he were sitting on the 110 A.C. I thought perhaps he might be inflicted with the St. Vitus' dance; but no, I believe he thinks someone is about to throw something from behind. Possibly a rolling pin from the party of the second part, who has called him many times for dinner."

If it wasn't that the contest is officially off I would award Mr. Lufkin the crisp notes.

The next verse is entitled: "Oh, who told Mr. Tate they were electrose?" accompanied by the Sun (son) who melted them. Miss Snodgrass will follow with: "It's some hot in Vacaville" at the organ.

Sergeant Lufkin is no more. At least the Sergeant part of it. He has checked out of Uncle Sam's brown suit and leggins. He goes about in a disillusioned manner, scratching his lower limbs. He cannot get accustomed to the fact that his leggins are loose. Civilian clothes ain't got no leggins, Mr. Lufkin.

I have a friend in the East who has written me. He did not sign his name. Of course, there is no way of telling whether he is a friend. At any rate he must be a friend because he says he is a radio bug. So am I. He writes in a style that has something in common with Ring Lardner. His ideas are like those of Kerensky, while he is practical like Mr. Ponzi.

He delves into doing away with Q.R.N. and other subjects of lesser importance with a deal of perseverance. He says that subjects like Q.R.N. are his selections of discussion. Mainly because he doesn't know anything about it. Neither does anybody else. That's why he can talk about it without being interrupted. Everybody takes it for granted he knows his business.

So he tells the Fordham Radio Club of New York many things. About Q.R.N. They, of course, don't know what he is talking about. I listened to an engineer lecturing one night. I couldn't just say whether he was talking English, French or Eskimo. When he finished they all clapped. I clapped, too. Fine speech! Hooray! I wouldn't know what this man was talking about either, only I have it down in black and white.

He says in part:

"A Flash! Lightning! And what did I see—Nothing. It was dark. "Stars were shining in the heavens." Of course when I read that I knew he was conducive to bugs. And how could it be a storm? Perhaps someone fired at me point blank.

Blank cartridge. No. There it was again. A Flash! Gracious! The goose pimples pimpled out on my purple flesh like gooseberries. Aha. What was that? That bright light on the ground. Presto—a lightning bug. No, my friends, it's quite plain. History tells us that QRN is only in the summer. So is the lightning bug. Am I not right? I am. Therefore, we, as amateurs, us radio men, us bugs, we must exterminate this bug."

Professor Goosepimple here concluded. It was a great speech. They all clapped. Great excitement prevailed.

MORAL: When it's time to clap. Clap. Hooray!!



PUBLIC RECOGNITION OF A RADIO RECORD.

This illustration is self-explanatory, the text reading: "By use of a vacuum tube two amateur operators at Keyport, four miles from here, on Oct. 6, 1920, created a new wireless record by transmitting to Scotland with 1000 watt power a phonograph record."

The little lady sat in the parlor sewing. It was stormy outside. Little drops of rain pattered on the pane. The little lady, whose hair was gray, lived in a little gray house. 6CH lived next door.

She was humming an old lullaby as she sewed. Hark, what was that? Rats!! Certainly not. Her house was clean. A rat would starve to death therein. Hark. What was that? It was in the attic. Unmistakably it was a noise. She became nervous. She telephoned. "Hello. Is this the police? Well, there is a burglar in my house. Come quick."

Four burly, freckle-faced, red-haired Irish protectors of the law rushed to the scene of the alleged criminal's activities.

"Listen," said the little lady.

They did.

A weird cadence emanated from the general direction of the stove pipe.

"Aha," says the burly captain. "He is still there. Let us attack." They rushed the garret. It was empty. (Brownie had stopped sending next door.)

After a thorough search they went down stairs. The officer reached for a glass of water. A hot spark reached out and got him when his bony finger was within an inch of the spigot. "Whoop," he yelled. The light went out. He reached up to turn it on. "Whoop," he yelled, as a full 1250 volts nipped his finger.

"Lady," he said, "this is beyond us. There is a deep plot here. Something superhuman. We must call in our physics department."

The next day 6CH heard about the commotion. Now 6CH is foxy. You have to hand it to him for brain work. He gently slipped upon the roof of the little lady's house and grounded the stove pipe. The police department is still watching the house. But 6CH hammers away in peace and the little lady in the little gray house is wondering. Wonder-

ing how in the world things come and go so quickly.

### TACOMA

"Tacoma promises some photos of the leading stations in that territory." That's what they tell me in a letter. Well—. We are reserving the space, Tacoma. Come across.

In their onward flight of progress and aggressiveness the Tacoma Club has annexed another strategical victory in securing a room in the Chamber of Commerce. They are allowed full freedom of the rooms and contemplate the installation of a long and short wave receiver therein.

Tacoma says that the Portland Club has put into effect a new set of traffic laws. They don't seem to grasp the meaning at all. They want to know since when has Tacoma become a suburb of Portland. They well realize that their Portland brothers are fast; but that they are altogether too far ahead of the times.

According to Portland's view, we might say that Spokane's mayor and council will soon be out of a job. New York is going to annex it. Imagine meeting a friend on Broadway in New York and upon inquiry as to where he is residing: "Oh, yes, I live over in Spokane; got a commuter's ticket" ???

But taking it all-in-all, Tacoma thinks Portland's club is absolutely O.K.—inasmuch as Portland and Tacoma both wish to do "DX" work this winter. So Tacoma asks Portland: "For the love of Mike be reasonable and amend some of 'them there' stringent policies."

7CE is getting to be a regular "C.W." wizard. He has now arrived at the point where he can argue with 7KM, and believe-you-me it takes somebody who knows something to do that. He should have a Croix-de-combat. So far as known he is the only person having the necessary nerve to even think of such a thing. Well—it's the survival of the fittest. May the best man win. Stay with 'em, 7CE.

Hey, Skinnay! Has anybody got an X-ray tube for Otto Nicholson to experiment with? If you have any old junk aroun' mail it to him. He would sure appreciate it.

Tacoma says to Seattle: "Why all the high power for short distance work?"

7LV, Al Stenso, is recovering from an operation and will be back shortly. "Al" has had a hard time of it, and the "gang" all welcome him back with best wishes.

The following appeared in a newspaper of recent date: "An official in Washington said it was hoped that in the near future radio phones could be utilized to broadcast weather and market reports and other information. Such a system, he said, would eliminate the telegraphic code and make it possible for reports to be received in homes."

(Continued on Next Page)

Once Again—

# RADIO

The new name of "PRN."  
no more—no less.

I wonder if he gets his news by runner. There must be some delay. We, of the Pacific Coast, have been doing this very thing for almost a year.

News from the WEST must be subject to "indefinite delay."

I also noticed in another part of the paper that "for the first time a dance in New York had been held to radio music. And the surprising feature of the whole thing was that the MUSICIANS WERE 30 MILES AWAY."

This certainly is interesting to us on the Pacific. But not NEW. The interesting part is that we are glad our Eastern brothers are following in our footsteps, even though they have been two years tardy. They dance to music from San Francisco in Tacoma, received on a GALENA detectors—800 miles.

### PORTLAND

Portland announces that in order to get the proper harmony and co-operation for the coming winter campaign they must have rules. As a result they have got together and blossomed out with the following set of regulations. Woe be to the Adam's Apple that bubbles derogatory thereto.

1. Portland police report will be cleared between 9:30 and 9:45. (If you think the "cops" are after you, cause a lot of QRM.)

2. At 9:45 p. m. traffic manager, or one of his assistants, will ask for reports from long distance stations in Portland and vicinity and all stations will promptly report the traffic on hand, stating the number of messages for north, south and east. They will then QRX 'till 10 p. m., at which time the traffic is open for northern stations. As soon as one station clears his hook north he should QSQ the next man or sign off "CLR." It is intended that all northern traffic will be cleared by 10:30 p. m.

3. At 10:45 traffic will open for the south in the same manner as the north. Southern traffic will be limited to 11:00 p. m. (TAKE NOTICE ALL YOU SIXES.)

4. At 11:30 all eastern traffic will be cleared in the same manner.

5. Promptly upon completion of all traffic the traffic manager will come in and advise ALL CLEAR. As soon as eastern traffic has been cleared stations will be free to chew the fat, make tests, talk to Mars, etc. But, in the event a long distance station says QRJ-1, it is up to you to tell him QSU at schedule for traffic.

Traffic manager ..... 7XF  
First assistant ..... 7ZT  
Second assistant ..... 7ZB  
Third assistant ..... 7ED  
"Your co-operation is requested."

7BP, who has just returned from Alaska, where he spent the summer operating at KXV, says: "There are two things that smell like fish, one is fish and the other is Eskimos." Ralph is the same old man except for a slight change in his fist, which has taken on "oil tank" characteristics.

Royal Mumford (7ZJ) is with us again. He has been spending the summer on his homestead at Randall, Wash. He says the fishing and hunting were great. When he did not indulge in the above mentioned sport the time was spent planning that spark for the coming winter. "Long May She Oscillate."

7ZK, the first operator on the S. S. "Senator," has been taking in some of the big stations on his travels up and down the coast, and he says the Northwestern stations can easily hold their own with most of the Southern stations which he has visited. New ideas obtained while visiting these stations were many and he expects to try them upon retiring to amateur life.

7ZB and 7ED have only been on the job about every other night of late. There has been much speculation as to what their occupation is during these other nights. Some say "Moonshine," others say "Peaceful Dreams." From my calculations I would not say "Moonshine" because of their ability to hold the air down three nights a week. Again, I would not say "Peaceful Dreams" because why not take turns at "Dreamland" and not leave such frightful gaps in the air? But what is it? I am not Sherlock Holmes. I give up. Anybody that can put any light on the subject please do so at once.

### Features in the November issue of "RADIO"

Beginning "Monthly Radio Patent Digest" an illustrated description of all the new inventions by Mr. H. G. Prost, one of the best radio patent attorneys in the country.

Illustrated description of the Federal Telegraph Company's big new station at Palo Alto.

"Four Flushing," a Dark Town radio tale of woe. First of a series of Darktown yarns by Clyde C. Young.

Another ripping good Samuel Jones story by Volney G. Mathison.

The How and Why of Radio Tuning, the first of a series of articles in ideas of one syllable, by B. F. McNamee, Chief Engineer of the Pacific Radio Supplies Co.

The Powerful U. S. Army C.W. station at the Presidio of San Francisco that radiates 21 amperes. By Captain C. I. Hoppough.

7ZT, ex 7DA, is getting in a few late hours. He has the same old 200 meter spark with the addition of a 375 meter wave.

### SCIENTISTS HEAR RADIOPHONE LECTURE

One of the features of the recent meeting of the American Association for the Advancement of Science at the University of California was the first scientific lecture ever delivered over the air when Clyde Young of the Associated Press (our own Squak McGuff) spoke on "Wireless Telephony" from the station of the Leo J. Meyberg Co. at the Fairmont Hotel in San Francisco. The lecture lasted half an hour and every word was distinctly heard. Mr. Young was thanked over the telephone by the convention delegates for his lecture.

### WIRELESS AT THE NORTH POLE

Dr. Donald McMillan, who sailed recently for a couple of years in the Far North near the magnetic pole, will have a wireless outfit adequate to reach civilization at many points, and can not only cheerfully keep in touch with everything that is doing, from Balkan wars to football scores, but can obtain scientific information of great importance. For example, if a magnetic storm starts up he can at once be informed of the exact moment of the first fling of the needle elsewhere, and will be in position to check the simultaneity of the onset of the storm and its exact correlation with the magnetic elements close to the north magnetic pole. With good luck he can get more information about the earth's magnetism and its correlation with solar disturbances in the next two years than has been obtained in the last 200.

### PITTSBURGH RADIO ENGINEERING SOCIETY OUTING

The Radio Engineering Society of Pittsburgh held its third annual outing on Saturday, August 6, at the Pines. The affair proved to be the most successful of its kind ever held in Western Pennsylvania. An elaborate program was carried out and many prizes were given.

Among the events were speed contests of twelve and twenty-five words per minute, magnet and insulator races and competitive pie-eating contests. Prizes were also awarded for the best C. W. transmitter and receiver, best wavemeter and best workable old relic. The apparatus judged in these contests was all of amateur construction.

Among the 300 present were many well known eastern radio men, such as F. H. Schnell, of Hartford, Conn., traffic manager of the A. R. R. L.; F. S. McCulloch, of Cleveland, now vacuum tube expert of the Westinghouse Electric & Manufacturing Co.; Frank Schlamaker, of Mars, Pa.; L. M. Ripple (Radio 8 J. U.); C. D. Emery (Radio 8 P. E.), of Canton, Ohio; Roland F. Palmer (Radio 8 D. E.), of Akron, Ohio; J. J. McKinley (Radio 8 A. J. P.), of Uniontown, Pa.; C. M. Charpenmug (Radio 8 W. R.), of Connellsville, Pa.; John C. Stroeble (Radio 8 Z. W.), and William C. Kirbach, of Wheeling, W. Va.; John G. Hoop and Prof. R. C. Colwell, of Beaver Falls, and Frank H. Freshwater, of Rochester, Pa.

At a technical meeting held just before the chicken and waffle dinner, Mr. Schnell gave a short talk on "Traffic Regulations," followed by Mr. Frank Conrad, whose topic was "Continuous Wave Transmission." J. C. Stroeble spoke on "Cage Antenna Characteristics"; F. S. McCulloch spoke on "Power Tubes," and Mr. E. P. Wiggin delivered an interesting paper on "The Antenna Radiation System." Mr. W. K. Thomas (Radio 8 L. F.), whose radiophone has been heard in the Catalina Islands, discussed "Spark and C. W. Transmission," and Mr. Rosenberg, publicity engineer of the Westinghouse Company, spoke on the broadcasting feature of the Westinghouse Station K. D. K. A.

### REGULAR CLUB ROOMS FOR CHICAGO CLUB

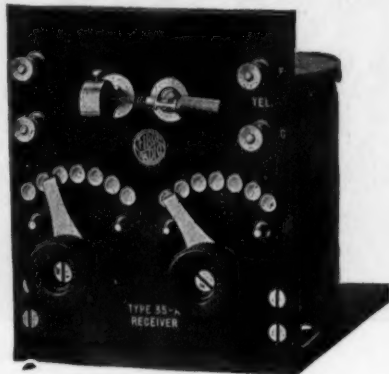
The Southside Radio Association now has regular club rooms at 2512 Blue Island Avenue. The rooms are open at all times and meetings are held each Thursday evening. A high class receiving and sending set has been installed and an effort is being made to make this club the best of its kind.



## New Apparatus and Supplies from the Radio Manufacturers

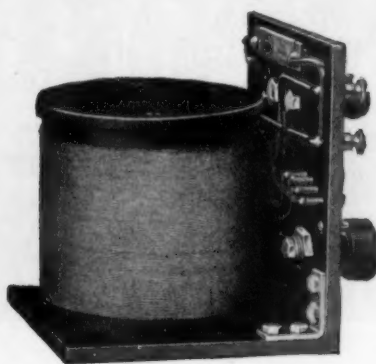
### FIRCO MIDGET INSTRUMENTS

A complete crystal receiver set and an audion amplifier recently has been provided for the amateur who wants a small receiving set at low first cost. These are the Midget instruments manufactured by John Firth & Co. Inc., of New York City.



### WESTINGHOUSE CO. INSTALLING INTERWORKS RADIO SYSTEM

The Westinghouse Electric & Manufacturing Company is arranging to demonstrate on a large scale one of the important commercial uses of radio apparatus by installing an interworks

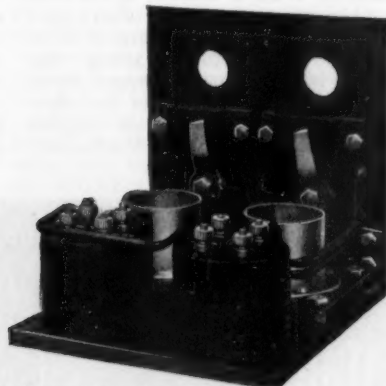
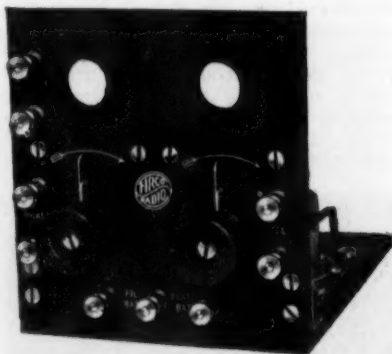


Front and Back Views of Firco Midget Receiver with Crystal Detector.

The receiver, as may be noted from the accompanying front and rear views, is a well made single circuit with a sensitive galena detector. The finish and workmanship are in every respect equal to larger standard sets manufactured by this company. The 1-4-inch Bakelite panel, like those in the Midget amplifier set, are 5 1/4 inches high. The binding posts likewise are arranged so that several units can be set alongside of each other and 3-4 inch busbars used to connect them.

system of wireless telegraphy and telephony. Factories at East Pittsburgh, Pa., Newark, N. J., Bloomfield, N. J., Springfield, Mass., South Philadelphia, Pa., Cleveland, Ohio, and elsewhere have been, or will be, equipped with high-powered transmitting and receiving sets, and it is expected that much of the pressing correspondence between these factories will be conducted by means of this system in the near future.

Several of the stations, notably those at East Pittsburgh, Cleveland, Spring-



Front and Rear Views of Firco Two Stage Amplifier.

The amplifiers are available in either one or two stages. They are equipped with Saco-Clad 100 per cent shielded transformers and are provided with Bakelite-base audion sockets and complete Firco air cooled rheostats. These have been successfully applied to six-stage amplification, wiring diagram for which will be published in an early issue. No. 14 hard-drawn copper wire insulated with varnished sleeving is used throughout, all connections being carefully soldered. All metal parts are made of heavy nickle-plated brass.

### WIMCO ISSUES C.W. CATALOG

The Wireless Manufacturing Company of Canton, Ohio, has issued a catalog of C.W. transmitting and receiving equipment that contains many illustrations and descriptions of the latest types of C.W. apparatus. Every radio man should have a copy of the WIMCO catalog—if he is contemplating on going into the C.W. field.

field and Newark, are already in operation. The East Pittsburgh station (KDKA) has become well known to all wireless operators (professional and amateur) because of its nightly broadcasting of concerts, addresses, church services, government agricultural reports and other interesting radio-phone messages.

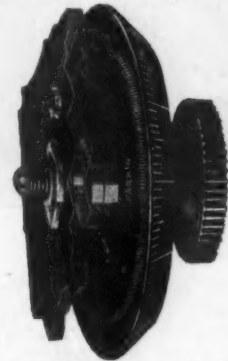
### WESTINGHOUSE ACQUIRES STOCK IN RADIO CORPORATION OF AMERICA

The Westinghouse Electric & Manufacturing Company have sold the assets of the International Radio Telegraph Company to the Radio Corporation of America, retaining certain patents, and rights in foreign fields. They have also obtained a substantial interest in the stock of the Radio Corporation of America and made commercial agreements with them regarding the sale of radio devices which are manufactured by the Westinghouse Electric & Manufacturing

Company, and which they will continue to manufacture. They have also retained certain rights in the wireless field, among which is the broadcasting of information.

### PARKIN DIAL TYPE RHEOSTAT

For the man building his own set a new dial type rheostat from the Parkin Manufacturing Co., of San Rafael, Calif., will prove a time and money saver. The non-corrosive resistance element is carried in a groove in the back of a three-inch molded Bakelite dial, which has a



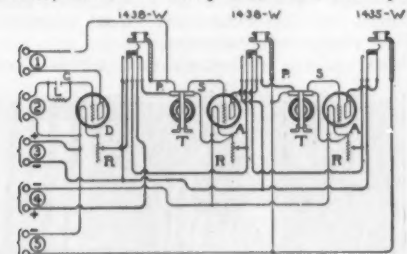
Parkin Dial Type Rheostat.

glossy black finish, all figures and graduations being filled with brilliant white enamel. The dial clears the panel by 1-16 inch, and runs true and smooth. A stop engages the stationary contact at the extreme positions, an "off position" being provided. The carrying capacity is 5 amperes, and the resistance 5 ohms, the full circle rotation insuring fine adjustment.

### FILAMENT CONTROL JACKS

By Cyril J. Staud, B. Sc.

In accord with the general trend of the times, which is away from the multiple-



DETECTOR & 2 STAGE AMPLIFIER USING FILAMENT CONTROL JACKS

NOTE  
1—To TUNER COIL  
2—To SECONDARY  
3—To 250V 2 HRS. GRID LEAK  
4—To 5 BAY 15 TO 30 VOLTS  
5—To 5 BAY 40 TO 60 VOLTS  
C—350W GRID CONDENSER  
D—DETECTOR TUBE  
L—250W 2 HRS. GRID LEAK  
A—AMPLIFIER TUBES  
R—RHEOSTAT  
T—250W TRANSFORMER

Fig. 1.

ity of switches which marked the "big set" of former days, is brought forth by the Federal Telephone and Telegraph Company the so-called filament control jacks.

They do not differ in construction from other types of standard telephone jacks, but their use in the hook-up given by the accompanying figures is a recent development.

(Continued on Page 118)

You Will Like—

# RADIO

Just wait a month and see what the new name means to you.

## Report of First Annual Convention



Official Photograph of American

**T**HE first convention of the American Radio League at Chicago, August 30-September 3, was a great success, both from point of numbers attending and from value of the discussions held. About 1200 delegates registered, and a large number of people visited the radio show held in connection with the convention.

The delegates were registered at the two convention hotels, the Sheridan Plaza and the Edgewater Beach. Convention meetings were held in the Auditorium of the Swift Grammar School and the radio show was staged in the Broadway Armory, Broadway and Thorndale streets. All convention activities were thus fairly well centered and at a distance of about five miles from the center of town, or the loop. This was a decided advantage in being near Lake Michigan in view of the extremely hot weather which prevailed generally.

Most of the delegates had arrived on

Tuesday, August 30, and while no program was scheduled for this day, all hands were busy in getting located, meeting other delegates and the exhibitors—in getting their booths ready for the following (opening) day.

The convention was opened by the President, Mr. Hiram Percy Maxim, at 10:30 a. m. on Wednesday, August 31, at the Swift School. This followed the assembling of delegates for the accompanying photo. The actual number registered, however, is not shown in the picture—at least twice as many delegates not arriving in time.

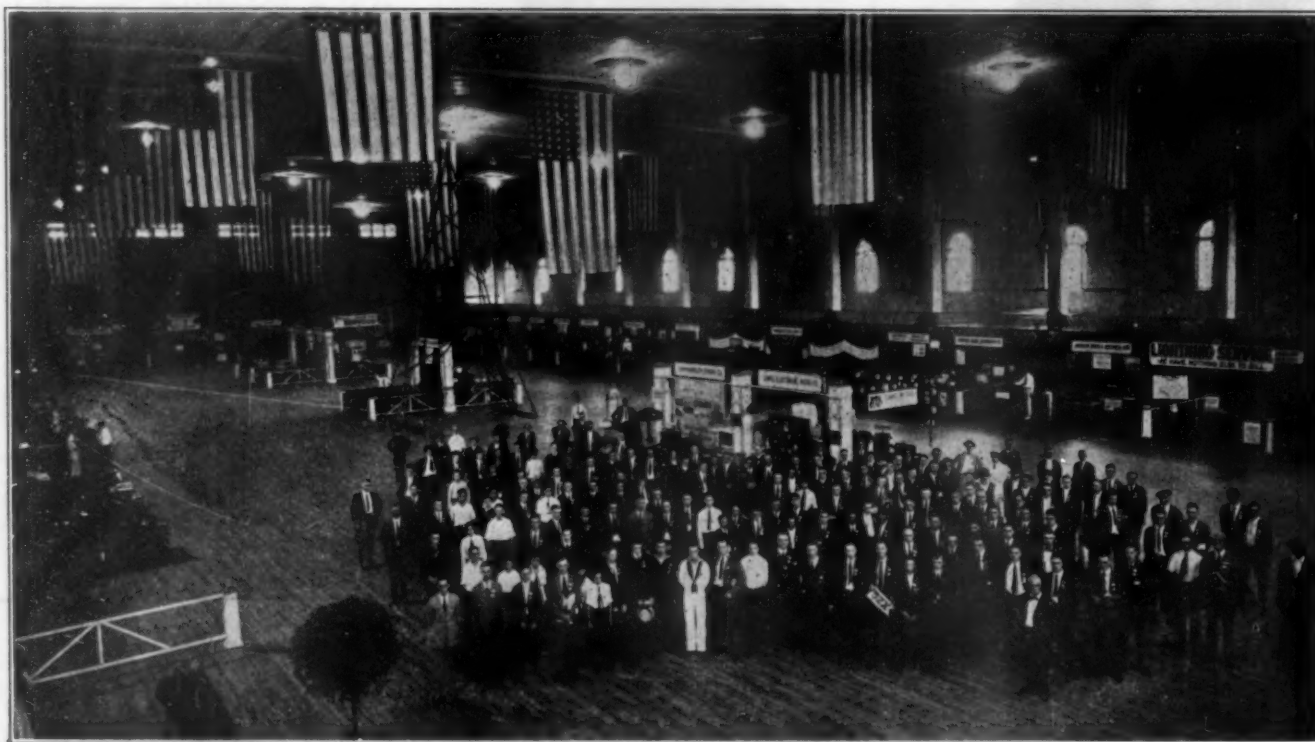
Mr. Maxim read a formal speech in opening the convention, and characterized it as an epoch-making event in Citizen Radio. Plans for making the A. R. R. L. international in scope were outlined and mention made of the fact that delegates from every state in the Union were present, Canada, Alaska and South America.

He declared that electric power, generated at some great water falls, will ultimately be flashed by wireless to factories and cities thousands of miles away. He pictured vast possibilities for this scientific feat.

"There will have to be the discovery of some new materials and some new scientific principles before this transmission is possible," he said. "It is reasonable to hope that some day men may transmit electric power by wireless. It may be the next great electrical invention, although not in sight just yet."

He also predicted that conventions in the future will be held by wireless with delegates sitting at home, hearing motions and speeches over wireless telephones. He gave as an example a recent test in Washington where an aviator made a speech to 10,000 persons assembled a mile and a half away from the point over which he was flying.

Addresses were also given by the rep-



Radio Show in Connection With Convention.



# n - American Radio Relay League, Chicago



Radio Relay League Convention.

representative of the Mayor of Chicago and Coroner Hoffman of Cook County. The latter spoke in a humorous vein and stated that he was glad to meet the delegates in a social and not an official capacity. It appeared that the coroner's chief claim to radio recognition lay in his being the official donor of the land on which the station of Mr. R. H. G. Matthews, 9ZN, is erected.

The Secretary of Commerce, Hon. Herbert Hoover, sent as his representative, the radio inspector in charge of the Bureau of Navigation, Mr. Terrell, who



U. S. Navy Exhibit of Radio Controlled Boat.

gave a short address, stating that he had been sent to the convention by Mr. Hoover to learn wherein the department could best serve the needs of the radio amateur, through the A. R. R. L.

A short and interesting talk was given by Lieut. Parmenter, officer in charge of the Naval Radio School at the Great Lakes Naval Training Station, representing the commandant of the Ninth, Tenth, and Eleventh Naval Districts.

Other addresses were given by officials of the A. R. R. L. and others.

At the afternoon session, several speeches and talks were given, including discussion of interference, control, time, revision regulations, traffic regulations and observance of radio laws.

The big event of the night session was the debate between M. B. West, civilian radio aide at the Great Lakes station and Lieut. Ellery W. Stone, general manager of the Pacific Radio Supply Co., of San Francisco, on the subject of power

factor in radio circuits. The nature of the discussion will be better understood by a reference to the articles by the above men in the February, April and July issues of "QST". Lieut. Stone contended that contrary to Mr. West's statement, the inductive and capacitive reactances in a freely oscillating radio circuit, or in a forced oscillating radio circuit tuned to resonance with the impressed frequency, are equal and opposite in value, the resistance is the only impedance in the circuit and the power factor of the circuit is unity. Mr. West finally conceded all disputed points except that unity power factor obtains in a freely oscillating circuit such as a gap circuit. Accordingly, the matter was referred by telegram to the Radio Section of the Bureau of Standards, which wired back stating that in radio circuits as outlined above, the inductive and capacitive reactances are equal and opposite in value—the resistance thus being the only impedance in the circuit. This telegram was read to the convention at the second evening meeting and a committee was appointed to decide which contestant had won the debate. The committee, however, decided to remain neutral on the matter and in their report stated that the two contestants had been arguing from different premises—a fact which was clearly evident the night preceding. Lieut. Stone requested that the Bureau of Standards' telegram be read into the minutes of the meeting and rested his case on the bureau's telegram.

Further talks followed on spark transmission and reception.

On the following night, the convention was given over to a consideration of Spark vs. C.W. To start the meeting, a talk was given on "Vacuum Tube Construction," by Lieut. Stone. This talk was illustrated with 20 photographs of the plant of the Moorhead Laboratories of San Francisco.

One point brought out in Lieutenant Stone's talk was that the reason that resistance coupled radio frequency amplifiers for 200 meters had not been successful was due to the form of coupling and not to the capacity of the tube. The very fact that tuned output circuits can be employed for this purpose is proof that the capacity of the A-P tubes at least is small enough. The trouble lies in the carbon resistance coupling,

which acts as a very low resistance to radio frequency, and in fact such carbon rods are used as kick-back preventers in transmitters. Mr. R. H. G. Matthews of Chicago and convention manager, stated to the convention that Major Armstrong had made the same statement to him a few days before the convention, and the matter of designing a special tube for r.f. amplification was thus proved to be unnecessary.

A number of excellent educational lectures were given on the following day, and in the evening K. B. Warner spoke on "Effect of Radiophone on Traffic Work"; S. Kruse on "Fading Phenomena" and H. M. Anthony on "Sidelights on Radio Development."

The final banquet and dance was held at the Drake Hotel on the evening of September 3. The feature was the club roll call. In addition to these formal features the committee had arranged many novel and enjoyable forms of entertainment which were greatly enjoyed by all present.

## SAN FRANCISCO RADIO CLUB NOMINATES NEW OFFICERS

At the regular monthly business meeting of the San Francisco Radio Club, Inc., held on September 1, the following nominations for officers were made: President, H. W. Dodge, H. W. Dickow and E. Schivo; vice president, C. Thompson, S. Fass, M. Heeder; secretary, H. W. Dodge and E. Schivo; treasurer, C. Schomaker (elected); sergeant at arms, M. Heeder and E. S. Peterson.

Election of officers will take place on October 6. Installation of officers on October 13. The newly elected officers will be installed by a prominent radio official of San Francisco. All local radio men, amateur or commercial, are invited to attend the installation. A lively program for the occasion has been arranged.

## WESRAD NOW AT OAKLAND

Western Radio Electric Co., of Los Angeles, has opened a branch at 274 Twelfth street, Oakland, Calif., where the radio amateur may get anything that he wants in the way of radio equipment and supplies, including general laboratory apparatus. The same Wesrad Service that has proven so popular at Los Angeles is now available to the San Francisco Bay radio enthusiasts. B. R. Norton has charge of the new Oakland store.

# EXPANSION!

NOT OF THE WAISTLINE  
BUT OF

## WESRAD SERVICE

OUR NEW STORE  
IS OPEN

STATIC ROOM N'EVERYTHING

274 Twelfth Street  
OAKLAND :: CALIF.

You Can't Keep a  
Good Man Down—  
Neither Can a Policy  
That Strives to Please—  
Stay Put!

## OUR STOCK BULLETIN AND PRICE LIST

In a new and handy form—  
The only Always-up-to-the-minute  
Price Dictionary in the field

Indispensable to the careful purchaser  
At your service

"FOR RADIO ONLY"

## WESTERN RADIO ELECTRIC CO.

550 SOUTH FLOWER  
LOS ANGELES

274 TWELFTH STREET  
OAKLAND

### CALLS HEARD BY WESTERN AMATEURS

This department has met with such favor that we will devote as much space to same as possible. Unusual Records are Particularly Desirable. Your list should be neatly printed in ink, using one side of paper only. All errors will thereby be avoided.

**CALLS HEARD BY 6AS, SAN FRANCISCO**  
(6AK), (6DP), (6EB), (6ED), (6FH), (6IC), (6KP), (6LC), (6MH), (6MN), (6PJ), (6ZX), (6ABW), (6ADL), (6AGF), (6AAK), (6AID), (6AJH), (6ALE, CW), (6ACR), (6AQU), (6AMW), (7BP), (7ED), (7GA), (7IN), (7IU), (7OZ), (7ZB), (7ZT), (7ZJ).

**CALLS HEARD AT 6OC, SAN FRANCISCO, AUGUST 14-31, 1921**  
(6DP), (6FH), (6IC), (6KP), (6MH), (6PJ), (6PR), (6TF), (6ABP), (6ABW), (6ADL), (6AEW), (6AGF), (6AIB), (6AJH), (6ALE), (6AMW), (6AQU), (6AVB), (7BP), (7ED), (7IN), (7IU), (7GA), (7KM), (7QQ), (7OZ), (7ZJ), (7ZT).

September 1, 1921.  
6IC, 2408 O St., Sacramento, Cal.  
The Pacific Radio News,  
San Francisco, Cal.

Dear Sir:

Am inclosing a list of calls heard during the month of August 1 to August 31, to be printed in your next issue of the Pacific Radio News:

6AE, (6AR), (6AS), (6AV), 6AAK, 6AAW, 6ABG, CW, (6ABJ), 6ABP, 6ACR, 6ACY, (6ADL), 6AEL, 6AER, 6AFH, 6AFO, (6AGA), (6AGF), 6AID, (6AJH), 6AJK, (6ALE), 6ALU, (6AMW), 6ANK, 6APE, 6APH, (6AQU), 6ATQ, 6AVV, 6BK, (6CH), (6DP), (6DY), 6DS, 6EA, (6EN), 6EX, 6FK, 6FT, 6GL, 6HC, 6HP, 6HY, (6IM), (6KA), (6KC), (6KP), 6KS, (6LC), (6MH), (6MN), (6OC), (6OH), (6OM), (6PJ), 6PO, 6PR, (6TF), 6TV, 6VX, 6WO, 6WR, 6WZ, 6ZC, 6ZAE, (6ZN), 7AY, (7AD), 7BK, (7BP), 7CB, 7CN, (7ED), (7GA), (7IN), 7IF, 7IW, 7IV, 7IY, (7KM), 7OZ, (7QQ), 7XD, 7ZA, 7ZB, (7ZJ), 7ZM, 7ZQ, 7ZS, (7ZT), (7ZW), YA.

Using one tube and spiderwebs. Thanking you in advance, I am

E. STADLER, 6IC.

### LIST OF CALLS HEARD AT RADIO 6IV, FROM MARCH 30 TO AUGUST 2

5ZA, (6AE), 6AH, 6AR, 6BW, 6CA, 6DA, 6DE, 6EA, 6EB, 6EN, 6ER, (6EX), 6FE, 6GF, (6GM), 6GP, (6GT), 6HC, (6HG), 6HK, 6HY, 6IF, 6IG, 6IH, (6IR), 6IS, 6JM, 6KA, 6KC, 6KM, 6KF, 6KS, 6KX, 6LC, (6LJ), 6MR, 6MZ, 6NC, 6OH, 6OT, 6OW, 6PJ, 6PO, 6PR, (6QR), 6TC, (6TF), 6TV, 6UN, 6VX, 6WH, 6WZ, 6XAD, C.W.; 6ZA, 6ZAA, 6ZE, 6ZH, (6ZJ), 6ZN, 6ZR, 6ZU, (6ZX), 6ZZ, 6AAG, (6AAH), 6AAT, C.W.; 6AAW, 6ABM, 6ABW, (6ACG), 6ACM, 6ACR, 6ACY, 6ADA, 6ADL, 6AFN, 6AGF, 6AGL, 6AGN, (6AGP), 6AHV, 6AIB, (6AII), (6AIO), 6AIK, 6AIU, 6AIW, 6AJH, 6AJL, 6AKL, 6ALE, C.W.; 6ALU, voice; 6ANK, 6APH, 6APO, (6APZ), 6ARI, 6ASS, 6ATB, C.W.; 6ATG, 6AUL, C.W.; 7CN, 7DA, 7ZJ.

### HEARD BY 6ABW, ROSEVILLE, CAL.

6AE, (6AS), 6AAK, (6ABM), 6ACY, (6ACR), (6ADL), 6AIP, 6AID, (6ALE), (6ALU, C.W.); 6AMU, 6AOX, 6APH, 6AQU, 6BW, (6DP), (6IM), 6KM, (6KS), (6MH), (6OC), (6PJ), (6PR), 6TV, (6TF), (6VX), (6WZ), (6ZN), (7BC), (7BK), (7BG), (7DA), (7ED), (7IU), 7JU, 7KB, 7KJ, 7KM, 7BR, 7WJ, 7XD, 7ZI, (7ZJ).

### CALLS HEARD BY 6BF, SANTA PAULA, CAL., FOUR NIGHTS, AUG. 1-4, INCLUSIVE

6AE, 6AK, 6AR, 6DP, 6EN, 6EU, 6FT, 6GY, 6HC, 6HH, 6HT, 6IB, 6KA, 6KC, 6KM, 6KP, 6MH, 6MK, 6OH, 6PJ, 6PP, 6PR, 6TV, 6UO, 6VV, 6VX, 6WZ, C.W.; 6ZN, 6ZX, 6AAK, 6AAT, C.W.; 6AAW, 6ABW, 6ACR, 6AEL, 6AER, 6AFN, 6AGF, 6AGN, 6AJH, 6AKL, 6ALE, C.W.; 6ALU, C.W.; 6ALV, 6AMK, 6AMW, 6ANJ, 6ANP, 6AOR, C.W.; 6ARC, C.W.; 6XAD, C.W.; 7PP, 7YA.

PAUL K. CHURCHILL.

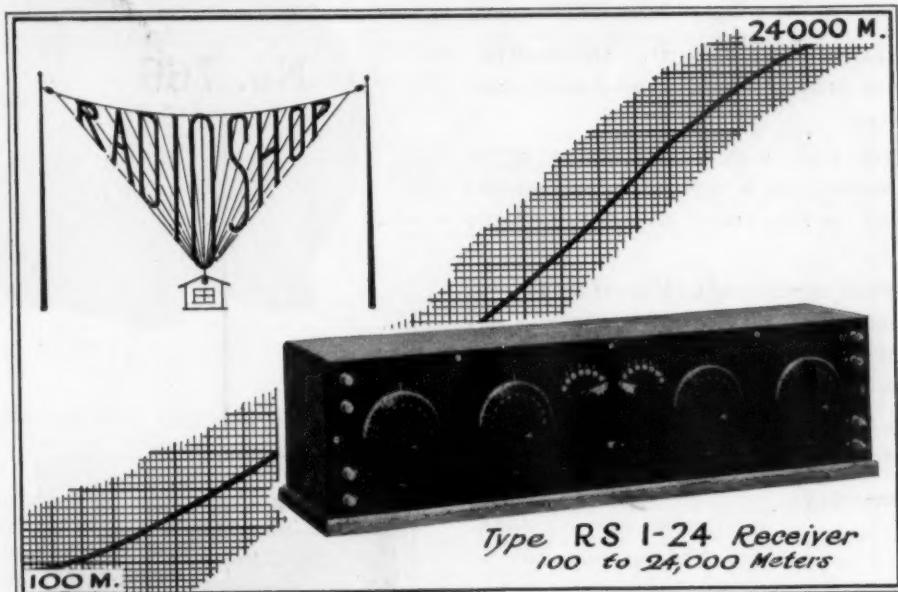
### CALL HEARD AT 6AJH, SAN YSIDRO, CAL., DURING JULY AND AUGUST

5IF, 6MK, 6ZN, (6ALU), 6AE, (6MZ), (6ZX), 6AMQ, 6AK, (6NY), 6AAG, 6AMN, 6DP, (6OC), (6AAK), (6AMW), 6EA, (6OL), 6AAU, 6ANK, (6EN), (6PJ), 6AAW, 6AGN, 6ER, 6PO, (6ABP), 6ALK, 6EX, 6PR, (6ABG), (6APH), (6FT), (6QJ), (6ABW), (6AQU), (6PG), (6SK), (6ACY), (6ATG), (6HY), (6TV), (6ADX), 6ATQ, (6IF), (6VX), 6ADF, 7DA, (6KA), (6WH), 6AFN, 7ZJ, 6KH, 6WI, (6AGF), 6KM, (6WR), (6AIB), (6KP), (6WZ), (6AID), (6LC), 6DA, 6AJK, (6MH), (6VV), (6ALP).

(Continued on Page 107)



## The RADIO SHOP type "RS 1-24" RECEIVER



*An original application of regenerative tuning to a receiver that covers, with the utmost efficiency, every wavelength in use today.*

Now ready for prompt delivery. The demand for the RS 1-24 has been far in excess of expectations but we have developed manufacturing conditions so that we can make immediate shipment

SAN JOSE

THE RADIO SHOP

CALIFORNIA

### ANNOUNCEMENT

Watch this space for illustration of the new

### Keystone V. T. Tube Socket

most rugged construction of any Socket on the market.

Sold on a money-back guarantee of Satisfaction, at the low price of \$1.25, prepaid.

Dealers: We have an attractive proposition for you.

**Keystone Radio Co.**

Greenville, Pennsylvania.

### AMPLIFYING TRANSFORMERS

**\$3.75** Bakelite encased. Compact. Efficient. Fully guaranteed on a money-back basis. Postage charges 12 cents.

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The standard insulating material for all radio work. Water-proof, permanent, strong, used by all important manufacturers of wireless apparatus and others requiring the utmost in insulation.

Furnished in sheets, rods and tubes.

We also manufacture VULCANIZED FIBRE in sheets, rods and tubes and CONITE, a special insulation, in sheets or rolls, from .005" to .020" thick.

Let us show how our standard products can be made to solve your insulation problems. Pacific Coast dealers carry a full stock of Bakelite-Dilecto, Vulcanized Fibre, Continental-Bakelite and Conite.

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**\$2.50**

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Anywhere  
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The Radio Engineers of the Federal Telegraph Company of San Francisco have compiled a wonderful book on the operation and care of small arc equipments for ship and shore station work. The book is written in non-technical, understandable fashion. No mathematics other than Ohm's Law resorted to. A valuable guide to the ship operator or those who desire to enter the Arc field. Limited supply on hand. They are going fast.

PACIFIC RADIO PUBLISHING CO., 151 Minna St., San Francisco.

## Valuable New Features Added to Eveready Battery

The manufacturers of Eveready Wireless B Batteries announce two new features which are now being built into the No. 766 Battery, and which greatly increase its usefulness.

No. 766 Battery is now being made with wood container, of the same character as No. 774. This wooden case is impregnated with melted paraffine, making the battery, which is also sealed in wax, practically impervious to moisture.

A second feature—and one which is welcomed by all radio fans—is the installation of variable voltages. One negative and five positive terminals give a voltage of 16½, 18, 19½, 21 and 22½. Each terminal consists of a flat brass strip with 3-16 hole in end for binding post.

These new features of the No. 766 are in line with ideal of the manufacturers of Eveready Products—to lead with the best.

And the price remains the same—\$3.50.

### No. 766



No. 766

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599 EIGHTH STREET

San Francisco

California

## NORTHWESTERN RADIO

*A Superior Line of Receiving Apparatus*



A detector and two stage amplifier that will give you results. This instrument is in use in many stations in the Northwest and its performance is a proven fact. You must see this set to appreciate its value. Material and workmanship are the best.

Specifications — Panel quarter inch grade XX bakelite dilecto. Gorton pantograph engraving. Oak Cabinet finished in flemish oak.

Knobs and dials are machined from sheet bakelite and turn TRUE. All socket supports are constructed of bakelite and cast aluminum.

Write for Catalog

Detector and two stage amplifier Type SR-2.  
Size of panel 10 1-2x12 3-4. Complete less  
tubes and battery \$70 f.o.b., Portland.

## NORTHWESTERN RADIO MANUFACTURING CO.

1556 East Taylor Street

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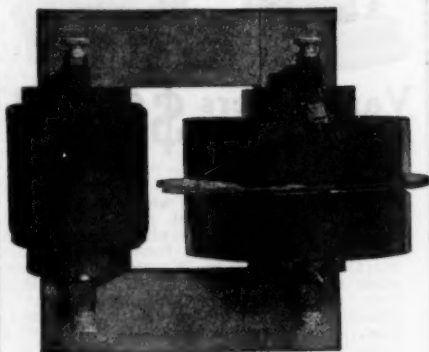


TYPE Z. R. V.

Variometer has unit construction with bakelite shell and hardwood ball. Has low dielectric losses and a range of inductance of 1.25 mil henry maxim to .1 mil henry minimum. Is readily used on table or mounted on panels.

Completed with 3-inch dial and knob ..... \$6.50

Without dial or knob..... \$5.75



TYPE Z, R. L.

Transformer for use with rotary spark gap has two section secondary, bakelite terminal supports and high grade construction, 400 watts power rating highly efficient at 200 meters.

Price ..... \$14.00

Apparatus which excels in those qualities which for 13 years of continuous manufacture have maintained its enviable reputation for reliability will be found pre-eminent in the display rooms of discriminating dealers and is manufactured by

**CLAPP-EASTHAM COMPANY**

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Catalogs mailed for 6c stamps

#### CALLS HEARD BY 6AQT DURING JULY AND AUGUST

6AE, 6AK, 6AR, 6CH, 6DP, 6EX, 6FK, 6GO, 6GY, 6HC, 6HP, 6IC, 6JR, 6JW, 6KC, 6KM, 6LN, 6MW, 6MZ, 6OC, 6OH, (6PJ), 6PR, 6SK, 6TH, 6TV, 6VX, 6WO, 6WZ, 6ZU, 6ZX, 6AAK, 6AAR, 6ABW, 6ADA, 6AGF, 6AHN, 6AID, 6AIW, 6AIP, 6AJH, 6AKL, 6ALE, 6C.W.; 6AMW, 6APH, 6AWZ, 6ALA, 6APE, 6XAD, 6C.W.; 7GA, 7ED.

#### Calls Heard During Daylight

6MZ, 6AJH, 6AKL.  
Anyone hearing my 6C.W. please QSL M. Graham 6784 Hollywood Boulevard, Hollywood, Cal.

Riverside, Cal., Aug. 8, 1920.

Pacific Radio News,  
San Francisco.

Dear Sirs:

Please find enclosed list of stations heard. Some were heard with single coils and tickler and others with a variometer set. Only one bulb was used:

6AA, 6AR, 6ER, 6GJ, 6GM, 6GT, 6HC, 6HY, 6IF, 6IR, 6IS, 6IV, 6KM, 6KP, 6LC, 6LJ, 6LS, 6LY, 6MK, C.W.; 6PJ, 6RK, 6WS, 6ZJ, 6ZX, 6AAG, 6AGQ, 6AHU, 6AIW, 6AJK, 6ALE, C.W.; 6ALP, 6ALU, C.W.; 6AMW, 6AOE, 6APH, 6APZ, 6AQU, 6ARE, 6ASE, 'HM'-Telephone, 'RA'-phone.

I have no license yet, but am waiting for it, and expect it daily. Will probably put in a 100-watt C.W. set this summer and get started in time for the winter work.

Yours truly,

**DONALD H. KEET,**  
469 Lime Street.

#### HEARD ON ONE-STEP BY 6AUN, 1730 PAGE ST., SAN FRANCISCO

6AE, 6AP, 6EA, 6EB, 6HH, 6IC, 6IO, 6KA, 6KP, 6LC, 6MN, 6OH, 6PJ, 6TV, 6ZX, 6AAK, 6AAP, 6AGF, 6AID, 6AIL, 6ALE, 6AVB, 6AWH, 6XAC, 6XAD, 7BK, 7BP, 7CA, 7CC, 7KJ, 7QQ, 7XD, 7XF, 7ZT. Anyone hearing 6AUN please QSL.

#### CALLS HEARD AND WORKED RADIO 6AQU, H. B. BECKER, 1117 W. 45TH ST., LOS ANGELES, CALIF., DURING THE SUMMER MONTHS

(6AE), (6AK), (6AR), (6AS), 6CV, (6DP), (6EP), (6EX), (6FK), 6FH, 6FX, 6GF, (6HC), (6HP), 6HX, (6IC), 6IM, (6KC), 6KM, (6MZ), (6OC), (6OH), 6OT, (6PJ), (6PR), 6SK, (6TV), (6VM), 6VX, (6WO), 6WZ, (6ZB), 6ZU, (6ZX), 6AAK, 6ABW, (6ACR), (6ADA), (6AED), (6AFY), 6AFN, (6AGF), (6AID), (6AIP), (6AJH), (6AKL), (6ALA), 6ALE, (6AMW), 6ANK, 6ANZ, 6APH, (6ARW), (6AVB), 7BP, 7GA, 7IU, 7KM, 7ZJ, 7ZT.

Will be glad to hear from anyone hearing me.

#### C.W. STATION 6AWT IN SAN FRANCISCO REPORTS THE FOLLOWING HEARD:

6AE, 6CV, 6EA, 6EB, 6HH, 6IC, 6KA, 6KP, 6LC, 6LX, 6MH, 6MN, 6RZ, 6BX, 6AAP, 6ADL, 6AGF, 6AID, 6ALE, 6AVB, 6AWH, 6XAC, 7BC, 7BK, 7BP, 7CA, 7CC, 7ED, 7KJ, 7KM, 7QQ, 7XD, 7XF, 7ZB, 7ZJ, 7ZQ, 7ZT. All stations were heard during the month of August.



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Chemicals,  
Cloth and Textiles,  
Clothing,  
Copper,  
Electrical Equipment and Supplies,  
Furniture,  
Hardware,  
Iron,  
Lead,  
Machinery,  
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(Kitchen and Dining Room),  
Monel,  
Musical Instruments,  
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Radio Equipment,  
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Stationery and Office Equipment,  
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Tin,  
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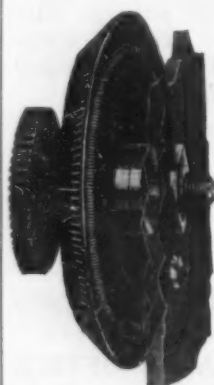
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THE PARKIN DIAL TYPE RHEOSTAT

(Patent Pending)

Consists of a 3-in. molded Bakelite dial, in the back of which is a circular groove containing the resistance element. This groove, being recessed, allows the dial to clear the panel by the usual distance of 1-16 in. An off position is provided, and a stop on the dial engages the stationary contact at the extreme positions. The 360 degree rotation insures fine adjustment. A brass bearing insures a true running dial and smooth action.

All figures and graduations are filled with brilliant white enamel. All brass parts nickel plated. Bakelite knob.

Resistance is 5 ohms, carrying capacity 2 amps.  
No. 77 Parkin Dial Type Rheostat. Postpaid \$1.75

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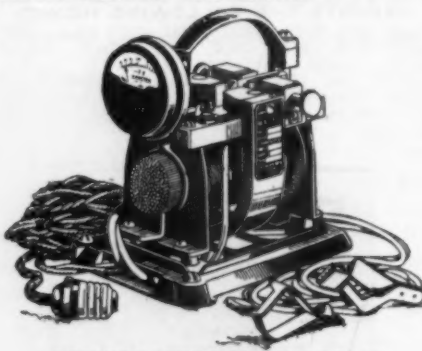
SAN RAFAEL, CALIFORNIA

**10c CHARGES YOUR BATTERY  
AT HOME F-F BATTERY BOOSTER  
WITH AN**

and your Wireless Station will never be closed because of a discharged battery. Is it not gratifying to feel that your filament battery will always be ready when you want it and that you will never have to give up in disgust when working a distant station? A Storage Battery kept fully charged lasts longer and everything depending upon it works better, which is the secret of perfect battery service, and a BOOSTER insures this. Do not run the risk of ruining an expensive battery, for it Costs Less to Buy a BOOSTER Than To Be Without One. The F-F Battery Booster is a Charging Apparatus, unfailing in its ability to deliver service day and night, is rugged and foolproof and requires no skill to operate. They charge automatically and operate unattended. Screw the Plug into a lamp socket, snap clips on battery terminals and watch the gravity come up. The AMMETER shows you just the amount of current flowing. Easily renewable and adjustable carbon electrodes rectify the current and last for thousands of hours. Everything is Complete in One Compact, Self-Contained and Portable Unit. The F-F Battery Booster is a Magnetic Rectifier for 105 to 125 Volt 60 Cycle Alternating Current. New Models Now at PRE-WAR Prices:

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both 6 Volt and 12 Volt Batteries at	
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The larger ampere capacity Types are recommended for the larger batteries, or where time is limited. Shipping Weights Complete with AMMETER & BATTERY CLIPS, 11 to 15 lbs. Order from your Dealer, or send check for Prompt Express Shipment. If via Parcel Post, have remittance include Postage & Insurance charges, or have us Ship C. O. D. ORDER NOW, or WRITE for FREE Descriptive BOOSTER BULLETIN No. 33.

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Other F-F Battery Boosters charge batteries from Farm Lighting Plants, Direct Current Circuits and Direct Current Generators. Do not think your battery is dead and worn out, because it seems dead. Buy a BOOSTER and Fill it with Life. A BOOSTER SAVES YOU MONEY.

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**"B" BATTERIES**AN  
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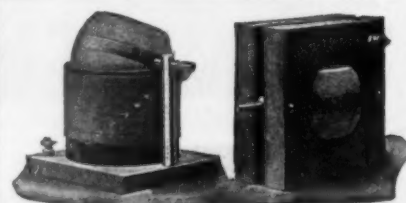
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Couplers EACH**

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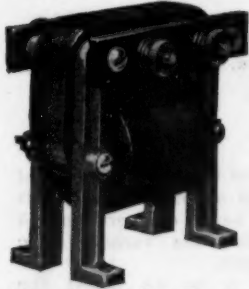
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READ THE CLASSIFIED COLUMN, PAGE 124.



Atlas Amplifying Trans-  
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The greatest of all Radio seasons is before you. ATLAS RADIO PRODUCTS are here to make it one of greatest success and achievement. Do not buy until you are thoroughly familiar with the excellence of ATLAS APPARATUS. Send ten cents in stamps for our catalogue of the latest CW telegraph and telephone instruments, receiving sets, parts and raw materials.

**PRODUCTION**

As the output of ATLAS instruments is limited to 15,000 for the next two months, you are advised to ORDER AT ONCE.

ATLAS AMPLIFYING TRANSFORMERS	
Mounted .....	\$5.00
Semi-mounted .....	4.00
Unmounted .....	3.50
Parts for same—	
Primary and secondary .....	2.50
Core .....	1.00
Four aluminum legs .....	.50
Panel and binding posts .....	1.00

#### ATLAS CW TRANSFORMERS

Plate Transformers, 500 Watt, 1000-1500 Volts

Mounted .....	\$24.00
Semi-mounted .....	22.00
Unmounted .....	19.00
Parts for same—	
Complete windings .....	15.00
Core .....	1.00
Supporting legs .....	3.00
Panel and binding posts .....	2.00

ATLAS CW CHOKE COILS 1/2 Henry 500 M.A.	
Double semi-mounted .....	\$ 7.50
Single semi-mounted .....	5.50
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ATLAS VARIOMETERS	
For Plate—For Grid (Specify Which)	
Complete variometer .....	\$ 6.00
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Each .....

#### ATLAS SUBMOUNTED VARIABLE GRID LEAK ON PANEL, \$1.50

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Panel .....	\$5.00
Panel, engraved, etc. ....	10.00
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ATLAS CABINETS	
For 5 1/2 x 6 1/2 in. panel, hinged top, 6 in. deep .....	\$4.50
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50 Watt, Secondary 375 Volts, Filament Windings, 10 V. Variable

Mounted .....	\$14.00
Semi-mounted .....	13.00
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Core .....	2.00
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Panel and binding posts .....	1.00

#### ATLAS CW POWER TRANSFORMERS

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Mounted .....	\$19.00
Semi-mounted .....	17.00
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Parts for same—	
Complete windings .....	12.00
Core .....	3.00
Supporting legs .....	2.00
Panel and binding posts .....	2.00

#### ATLAS FILAMENT HEATING TRANSFORMERS

75 Watt, Filament Voltage 8-10

Mounted .....	\$11.00
Semi-mounted .....	10.00
Unmounted .....	8.50
Parts for same—	
Complete windings .....	5.00
Core .....	3.50
Supporting legs .....	1.50
Panel and binding posts .....	1.00

#### ATLAS CW TUNING INDUCTANCES

6 Inch Formica Tubes No. 8 Enameled Wire

25 turn inductance .....	\$ 8.00
30 turn inductance .....	9.00
45 turn inductance .....	10.00

Atlas Amplifying Trans-  
former, Unmounted**DEALERS**

The debut of ATLAS RADIO PRODUCTS marks a new high water mark in Radio. ATLAS instruments include only the most efficient and most demanded. The distributing of ATLAS APPARATUS is your opportunity paramount. Do not buy your fall and winter stock of CW and receiving apparatus until you have seen ATLAS products and secured our catalogue and discount schedule.

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Mounted .....	\$ 5.00
Semi-mounted .....	4.00
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Parts for same—	
Primary and secondary .....	2.50
Core .....	1.00
Four supporting legs .....	.50
Panel and binding posts .....	1.00

#### ATLAS FILAMENT HEATING TRANSFORMERS

150 Watt Filament Voltage 10-12	
Mounted .....	\$16.00
Semi-mounted .....	14.00
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Parts for same—	
Complete windings .....	8.00
Core .....	4.00
Supporting legs .....	2.00
Panel and binding posts .....	2.00

#### ATLAS CW CHOKE COILS

1 1/2 Henry 150 M.A.

Double, semi-mounted .....	\$ 5.50
Single, semi-mounted .....	4.00
Double, unmounted .....	4.50
Single, unmounted .....	3.00
Parts for same—	
Coils, each .....	1.50
Core .....	1.50
Supporting legs .....	1.00

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Panel, 1 step .....	\$13.00
Panel, 2 step .....	25.00
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Cabinet, 2 step .....	30.00

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Detector and 1 step panel .....	\$23.00
Detector and 2 step panel .....	35.00
Detector and 1 step cabinet .....	28.00
Detector and 2 step cabinet .....	40.00

#### ATLAS CW CIRCUIT DRIVER

For measuring inductance, capacitance and wave length .....

#### ATLAS RECEIVING AND POWER TUBE RHEOSTATS

6 ohm 1.5 ampere for receiving tubes .....	\$1.00
6 ohm 7 ampere for 5 to 50 watt power tubes .....	\$2.00
4 ohm 16 ampere for 50 to 250 watt power tubes .....	5.00

#### ATLAS SPECIAL RHEOSTATS FOR CONSTANT VOLTAGE CONTROL OF POWER TUBES

50 ohm 3 ampere at 110 volts for primary control of 5 watt power tubes .....	\$5.00
50 ohm 7 amperes at 110 volts for primary control of 50 watt power tubes .....	10.00
50 ohm 15 ampere at 110 volts for primary control of 250 watt power tubes .....	15.00

Prices quoted on other sizes on request.

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(To Detect and Amplify Them)

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(To Make Them Roar in the Phones!)

**This is the NORTHRAD THREE-TUBE ULTRIFIER, the most sensitive Detector-Amplifier unit ever developed. Our Laboratory tests were amazing in results**

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Phone Kearny 2778

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Phone Douglas 3030

331 New Call Bldg., San Francisco

## NORTHWESTERN RADIO ASSOCIATION

Portland, Oregon

Editor P. R. N.,

San Francisco, Calif.

Dear Sir:

The amalgamation of all the radio clubs of the Northwest is well under way, and it is expected to result in better co-operation and understanding between the various radio bodies of the Northwest.

The organization is to be called the "Northwestern Radio Ass'n." The different clubs, such as the present Portland, Tacoma and Seattle clubs will be branches of the N. R. A. and will be addressed as follows: "Northwestern Radio Association, Tacoma Branch," etc.

The leaders of the different branches will meet at different times during the year at some central town to carry on any legislative business necessary for the good of the association.

The first and greatest task to be handled by the new association is to bring an International Convention of all radio men, including amateurs, commercial operators, radio manufacturers, radio engineers and inventors from all over the world to Portland, Oregon, in 1925.

This will be during the "Atlantic-Pacific Highway Electrical Exposition" and all attending this convention will not only be lucky enough to be present at the convention, but will see the greatest exposition the world has ever seen.

Now we well realize that it will be impossible for this association to make a success of this convention without the co-operation of the various radio papers and journals. The "Pacific Radio News" is one of the papers we are very anxious to have back of us in putting this convention through. We well realize that it will be almost four years before the convention, but an undertaking of this size cannot be successfully carried out in much shorter time.

We hope to see your paper back of us by helping us put this thing through, by articles in its favor in your editorials and columns.

Fraternalty yours,

(Signed)

C. B. CRITESER, 7DA.,

N. R. A. Publicity Agent.

Editor's Note: We're with you to a sizzle, fellows.

## \$5 AUDION PANELS \$5

Panel, 15 letters, has grid leak and condenser, dial, posts for tickler, etc. Send 3c in stamps for enlarged lists and data.

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### "HUMBUG"

(Continued from Page 90)

on a two-inch coil an' a bunch of half-dead dry batteries.

"However, soon as it was dark, I adjusts the gap for the best spark I can get, which isn't very good, an' tries a few calls. I soon sees I'll never raise the yacht this way, an' I decides that the best chance we got its to broadcast distress signals, in the hope of pickin' up some vessel in the Bering Sea.

"It was well after dark now. A pale, sickly moon was shinin' down on the cold, black lava-rock; and down among the boulders on the beach, the Bering Sea swashed dismal-like.

"S-O-S S-O-S S-O-S Stranded on Skull Island," I begins repeatin' over an' over, slow an' steady. The gang, shiverin' in the damp, raw southwest wind, all stands around that little flickerin' blue spark, which keeps gettin' rougher an' weaker every minute, until at last it breaks down altogether.

"As I tinkers with the vibrator, givin' it a lighter tension, I observes Muckashouk standin' alongside me with his old tauntin' smile.

"Humbug, eh?" he says, questioning-like, pointin' at the outfit.

"No, blast you, no humbug!" I howls, jumpin' to my feet. 'Get away from me an' stay away from me, before I knock your blasted block off!

"I fusses around with the coil a little longer, but the batteries are about gone, an' at last I gives it up.

"We'll haft'a wait an' see if anybody's picked it up," I tells the bunch. 'If nobody shows up by tomorrow night, the batteries'll be recuperated a little, an' I'll try again.

"We sets up the tents an' rolls into our blankets, but we don't sleep much. Morn-

in' comes, cold an' clammy. We makes a fire with some of the alder boughs from the old burial platforms, an' sit around, miserable an' gloomy, all day. No boat shows up, an' I don't expect none.

"That night I sends out the distress signals again, but in a few minutes the batteries drop down to nothin'. I hooks in all the audion batteries, but it didn't help none. Meanwhile, old Muckashouk comes hangin' round again with his blasted insultin' smile. As I close up my apparatus-box, I can see he's goin' to speak. Pretty soon he comes out with it.

"Humbug now?"

"Well, I gets's so blasted mad I near to chokes.

"Say, I told you to keep away from me!" I yells, steppin' up to him and shakin' my fist in his face. 'Things is bad enough without a miserable old flea like you naggin' around makin' 'em worse! Now you shut up an' keep shut up, or I'll bust your homely old map!

"We spends another night an' day of misery, gettin' more despondent all the time. The weather is gloomy an' cloudy, with the raw, wet southwest wind still holdin' on. In the afternoon, I tinkers with the coil again, but the batteries are sweatin' all over now, an' so near dead I can't get a buzz.

"S'all off," I tells the bunch. 'We're up against it!

"Nobody says a word. Pretty soon old Muckashouk gets up from the rock he's sittin' on, an' shuffles over to me.

"Uh-huh, humbug now, eh?" he remarks, with his sour smile.

"I bounces to my feet, aimin' to smash him in the face, but just as I was about to let drive, I gets a queer hunch.

"Yes!" I says, all of a sudden, sittin' down again, beaten-like. 'It's humbug.



### THE VARIO-COUPLER

BEARING SHAFTS with spacing shoulders turned from the shaft itself, (NOT loose tubing or washers slipped over), are used, assuring good contacts. This also prevents shaft from becoming loose in rotor.

BEARING STANDARDS are made from flat brass stock, so formed, drilled and tapped that, without any changes whatever, Vario-Coupler may be mounted on back of panel or directly on table.

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Wireless is all humbug. Heap plenty rotten humbug! More humbug than missionaries an' tin-horn gamblers;

"A-a-ah! Aaith-tuck!" croaks old Muckashouk; an' we're all amazed to see that he's kind'a smilin' all over. 'No tell truth, die—tell truth, no die!' Beckoning to us to follow, he leads us down to the beach; an' there stowed away among the boulders, is the ten-gallon can of gasoline we'd missed from the boat!

"Well, don't that beat yuh!" sputters the Head-Cracker.

"It does," I answers, solemnly.

"Muckashouk stoops down to pick up the can of fuel—an' then he stops an' stares with a sickly look on his wrinkled face. We all look, an' see, around the bottom of the can, some little puddles of gasoline. Tin-Pan grabs the empty can, an' turns it over. Along the bottom edge is a nasty rusty crack, about half an inch long.

"Double-crossed hisself!" mutters the Head-Cracker. 'Serves him right!'

"Never mind him—how about us?" busts out Tin-Pan, wild-eyed.

"Old Muckashouk's sour smile was clean gone now.

"Me darn fool!" he says. Then he hangs his head an' stumbles off.

"A little later we have a conference. I suggests we try to sail or row the boat, in spite of the wind an' current, but the sourdoughs veto that idea, declarin' it would only be committin' suicide.

"We know this place," says the Head-Cracker. 'Durin' these spring months of th' year the Aleute burial parties have the fight of their lives sometimes with this current—even in their narrow, speedy kyaks;—an' in this old tub we'd go straight out into the middle of the Berin' Sea.'

"That night, the southwest wind brings a cold, gray fog out over the water, makin' a clammy ghost-land out of the island. About two in the mornin' I was dozin' by fits an' starts, half froze to death, when all of a sudden Tin-Pan flies up out'a his blankets with a blood-curdlin' screech that brings us up all standin'.

"Ow! Help! Help!" he howls. 'They're walkin'!' Them skulls an' bones is walkin'!

"Sufferin' wildcats! Where?" I yells, my hair standin' on end.

"Everywhere! All around here!" blubbers Tin-Pan, hoarse-like. 'One bony clatterin' sku'uton with long black hair on its skull come an' grinned right in my face!'

"Yer gittin' out'a your head, Tin-Pan," says the Head-Cracker, soothin'-like; but I notices he looks around pretty sharp in the fog himself. There was no more sleep after that. I walks up an' down among the rocks till daylight, doin' some of the hardest thinkin' I ever done in my life.

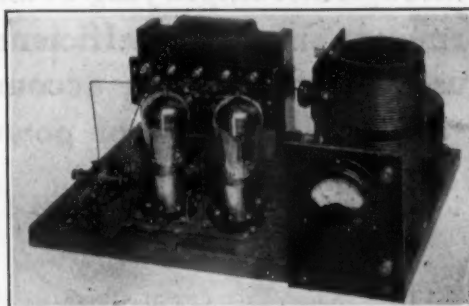
"When you was a kid, did you ever fly a kite?" I asks the Head-Cracker, who is sittin' on a rock, wrapped in his blanket.

"Murderin' snakes! Are you gittin' cuckoo, too!" he gasps, starin' at me. 'What we got to do with kites?'

"A lot, maybe," I tells him. "It's just about our last chance of getting away from this bone-pile alive.

"We tears a batten off the gas-boat, an' with our jack-knives makes a kite frame. Sir Ambrosius contributes a silk under-shirt—pretty dirty now—for a coverin', an' we rips up Greasy Bill's extra pair of pants for a tail. I had about 200 feet of seven-strand aerial-wire, which I puts the gang to untwistin'. I splices the single  
(Continued on Next Page)

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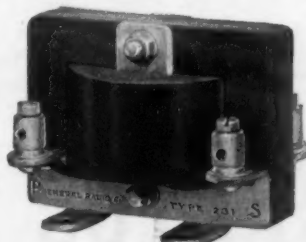
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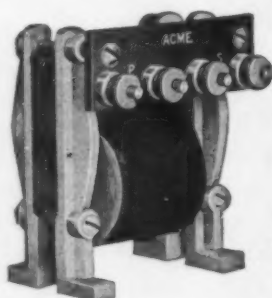
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Eddy currents reduce the impedance and hence the efficiency.

The impedance should be approximately equal to the tube circuit.

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strands end to end, makin' a total length of about 1400 feet. I figures that if I can get the kite to lift this, I might have a chance of breakin' in on K-O-X-N at Pirate Cove, about forty miles away, who works a midnight schedule on 1600 meters with N-P-R.

"But ain't your batt'ries dead?" questions the Head-Cracker, when I explains the idea.

"Yes—but ain't there a set of Edison batteries in the gas-boat for ignition?" I returns.

"We makes the kite, an' when we tries her out, she flies without any trouble. I gets the Edison cells out of the boat an' hooks 'em up to the spark-coil. About eleven o'clock that night we sends up the kite, an' pays out the bronze wire, which we had wound around a stick. When the wire is all out, the Head-Cracker hangs onto it with a piece of rope and a insulator. I hooks the end of the wire down onto the spark-gap, an' adjusts the coil. She didn't give a very long spark on that aerial, though it was bright an' fat. It didn't look bad—but K-O-X-N was forty miles.

"I begins hammerin' out the distress signals along with the same words I'd sent before; while the Head-Cracker stays alongside me, handlin' the kite. The wind is gettin' fresher all the time, an' the way that kite lunges an' jerks once in a while makes me suck my breath. But the little bronze wire holds her until about two in the mornin', when a gusty squall snaps it at last an' carries the kite off into the sea.

"As daylight comes, the wind suddenly flies round to the northwest; an' like a crack of a whip, a freezin' gale comes swoopin' over Skull Island. In a few minutes the storm whips up a wild, white-crested chop, an' the icy wind rips off the tops of the waves, whirlin' up a white misty spray that covers the whole ocean.

"She's gonna be a blizzard!" predicts the Head-Cracker in a low voice, studyin' the dull gray clouds flyin' overhead. 'If we don't get away from here today we'll be froze t' death 'fore dark.'

"This is—aw—terrible!" declares Sir Ambrosius, scratchin' his dirty week-old stubble. 'If we could only manage a bawth—'

"Just then a gusty blast, bringin' a flurry of hard, dry snow, comes swirlin' over the island, an' both our tents turns into aeroplanes an' disappears. We all crouches around among the boulders, tryin' to find a little shelter, till in about half-an-hour the squall passes on, leavin' us pretty blue an' stiff:—an' then hardly a quarter of a mile off the island, pitchin' wildly in the white-capped seas, we discovers—a boat!

"Hurray!" yells Tin-Pan, jumpin' up an' huggin' Greasy Bill, who happens to be nearest to him. 'We're saved! We're saved!'

"It's th' 'Empress'" says the Head-Cracker, studyin' the hull and top-work. 'She's a gas-boat belongin' to th' Pacific American Fisheries over at Port Moller.

"I never knew the 'Empress' was such a pretty boat!" blubbers Tin-Pan, who is still tryin' to kiss Greasy Bill. 'Whv, she's downright be-e-u-tiful!'

"The big tug bucks up to the mouth of the cove, an' sends a dory in to the beach for us.

THE operator over at Pirate Cove picked up your distress call last night, says the skipper of the "Empress," when we were all in the warm gallery, hard alongside a pot of fresh steamin' coffee

(Continued on Page 116)

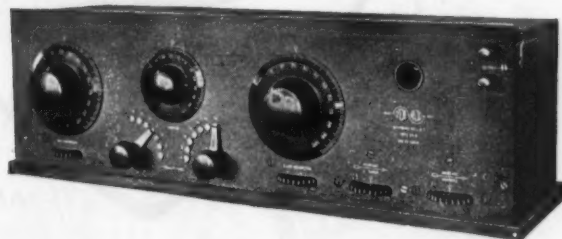




"Says Confucius: 'A man who, while living in the present age, reverts to the ways of antiquity, is one who will bring calamity upon himself.'"

"What terrible fate must be in store for him who, knowing the worth of the CR-8, persists in using ancient apparatus—which Confucius would have cast into the muddy depths of the Yang-Tse-Kiang."

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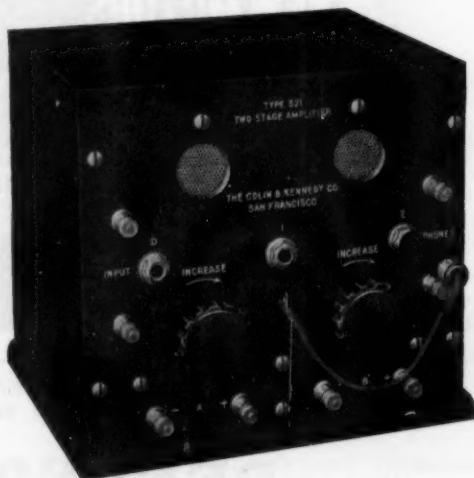
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Your dealer will gladly order one of these receivers for your inspection. Ask him for bulletins.

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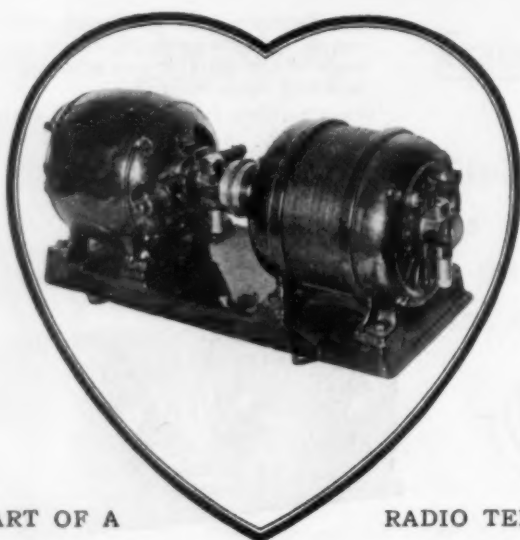
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DeForest and Wireless Shop Condensers.  
Vacuum Tubes, Moorhead, Cunningham, Radiotrons.  
Bakelite V. T. Sockets, Filament Rheostats, Remler & Parkin.  
Remler Audion Control Panels.  
Duolateral Coils and Plugs.  
DeForest Coil Mountings. Turney Spiderweb Coils.  
Phones: Murdock, Baldwin, Stromberg-Carlson.  
Radio Corporation Grid Leaks, 30 values.  
Grid Leak Mountings. Electrode Insulators.  
Bakelite and Formica Tubes, Sheets, Rods.  
45 Volt tapped "B" Batteries.

Wireless Supplies of all kinds. Goods postpaid.  
Write for prices.**AMATEUR WIRELESS SUPPLIES**

V. C. DeChesne,

Gridley, Cal.

an' a pile of red-hot chow. 'He wire-  
lessed the news over to the Port Moller  
operator, and we started right away.'

"A few minutes later I hears one of  
the Aleute hands of the tug pow-wowin'  
with old Muckashouk.

"Wirelessuck tung-ugh-tuck chi Pirate  
Cove Wirelessuck—Pirate Cove Wirelessuck  
chuckalooden chi Port Moller Wirelessuck.  
Adockoo whee-joolen gasolinuck 'Empress'  
tyloonuck. Wirelessuck asisth-tuck!"

"Gulpin' down a horse-bite of canned  
mule, old Muckashouk starts to answer  
—an' then discovers that I'm watchin'  
him.

"Humbug!" he growls."

**RADIO NOVICE PENALIZED**

Because he deemed the 200-meter  
wave length allowed amateur wireless  
operators too congested, John Imsand,  
40 Goethe street, Daly City, Calif., sent  
out radio messages on 240 meters, where  
things were not quite so crowded. But  
government radio inspectors who hap-  
pened to be listening in on 240 meters  
heard Imsand sending out pleasantries  
through the air and now his wireless sta-  
tion at his home has been ordered closed.

**U. R. T. A. ELECTS NEW OFFICERS**

AT the second annual convention of  
the National United Radio Tele-  
graphers' Association, held in New York  
City August 15 to 18, the following of-  
ficers were elected for the ensuing term:  
National president, Claude C. Levin; na-  
tional first vice-president, H. L. Le-  
Compte; national second vice president,  
R. H. Murphy; national third vice-presi-  
dent, J. C. Mitchell; national secretary-  
treasurer, Alfred De Silva, and eight  
members from the various districts to  
comprise the executive board.

**NEW MOTORS**FOR ALL PURPOSES  
STANDARD MANUFACTURES,  
PROMPT DELIVERY

ALL SIZES UP TO 5 H.P.

We Specialize In Small Motors &amp; Generators

ALL PHASES AND FREQUENCIES IN STOCK AT ALL TIMES

Largest exclusive Mail Order Small Motor dealers in the world.

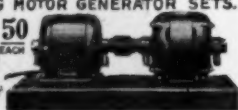
CHAS. H. JOHNSTON, Box 88 West End, Pittsburgh, Pa.

WIRELESS, TELEPHONE GENERATORS

500 VOLT - 100 WATT - 3400 R.P.M.

FOR MOUNTING MOTOR GENERATOR SETS.

\$28.50

WRITE FOR  
CATALOG

Radio Amateurs of COLORADO,  
UTAH NEBRASKA and WYO-  
ING, do you know

**DENVER**

HAS THE LARGEST WIRE-  
LESS SUPPLY STORE in the  
MIDDLE WEST.

We are Exclusive Agents for DeFOR-  
EST, REMLER and RADIO SHOP.  
Complete stock of MURDOCK, FIRTH,  
CLAPP-EASTHAM and all standard  
Radio Supplies, from which we make

**IMMEDIATE DELIVERY**

Write for our Bulletins and Price List.  
We will give prompt Mail Order Serv-  
ice by Parcel Post or Express, as  
requested.

Our "REYNRAD" Short-wave Coils  
are best on the market, \$2 each.

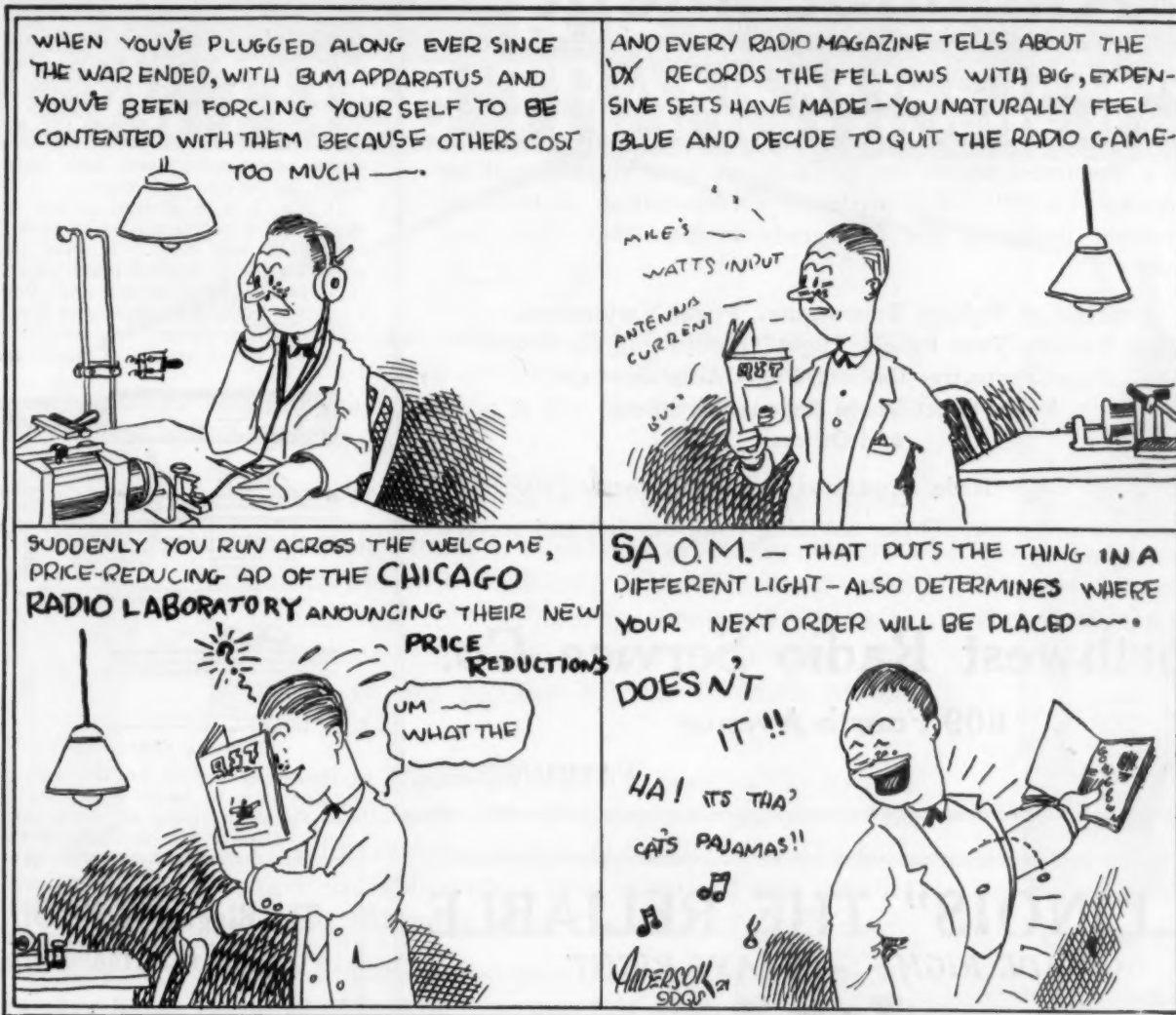
**REYNOLDS RADIO CO., Inc.**

613 19th St.

DENVER, COL.



## Don't Feel Blue—Let the Tubes on your C. W. Set do that!



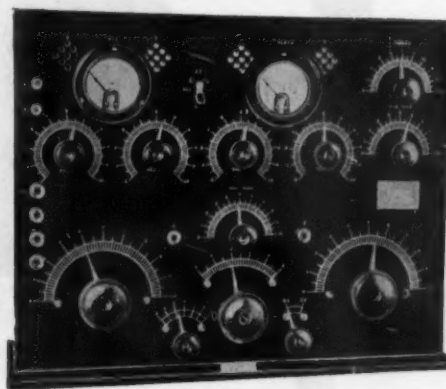
"OUR LATEST"

## "Z-NITH" RADIO APPARATUS

Has Been Reduced in Price Approximately  
15 Per Cent on Each Instrument.

These prices represent  
our contribution to-  
ward the reduction of  
the "High Cost of  
Radio."

Instrument	Old Price	New Price
Z-Nith Regenerator .....	\$ 65.00	\$ 55.00
Amplifigon AGN-1 .....	75.00	64.00
Amplifigon AGN-2 .....	105.00	89.25
Amplifigon AGN-3 .....	135.00	115.00
Hyrad Disc .....	12.00	10.50
Hyrad Non-Syn. Gap .....	65.00	49.00
Hyrad Syn. Gap .....	125.00	105.00
Jeweler's Time Rec. ....	75.00	69.50
Multiceiver MC-3 .....	265.00	236.00
Altaceiver CW-3 .....	300.00	254.00
C. R. L. Regenerette .....	12.75	12.75
One-Step Amp. AM-1 .....	33.50	28.50
Two-Step Amp. AM-2 .....	65.00	55.00
Detector AD .....	20.00	17.00
Detector ADP .....	30.00	25.00



Z-NITH MULTICEIVER MC-3

The most complete, efficient and flexible receiver ever designed. Described in detail in our Catalog F-21. Write for it.

## CHICAGO RADIO LABORATORY

Office and Factory, 6433 Ravenswood Ave.

Testing Station 9ZN—5525 Sheridan Road

CHICAGO, ILLINOIS

# Announcement

We are pleased to announce to our many satisfied customers that in addition to continuing our Mail Order Service which has made a wonderful record for SPEED, we have recently put on the market the "PUGET" products, a combination of the best engineering, designing and high-grade workmanship. This line includes:

Puget High Voltage Transformer, Puget Variometers  
Puget Vacuum Tube Panels, Puget Transmitting Condenser,  
Puget Protective Devices, Puget Amplifier Sets  
Puget Short Wave Regenerative Sets  
and Others

Nothing but High-Grade Apparatus Carries the name "PUGET"

Send for price list. Order anything from our list and receive it by return mail.

## Northwest Radio Service Co.

609 Fourth Avenue

SEATTLE

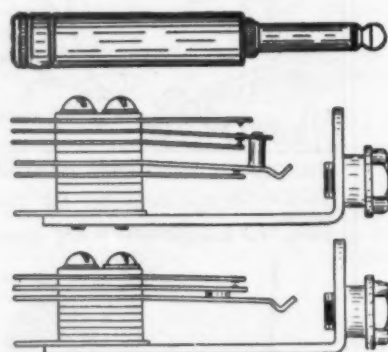
WASHINGTON

### FILAMENT CONTROL JACKS

(Continued from Page 101)

The function of the filament control jack is to obviate the necessity for filament current switches for detector and amplifier tubes. It also eliminates switches between amplifiers and between amplifier and detector, a saving in filament current which is wasted under customary operating conditions by leaving bulbs burning while not in use. Pushing in the phone plug connects the receivers to the circuit at the detector or desired stage of amplification and lights the bulbs, all in one operation.

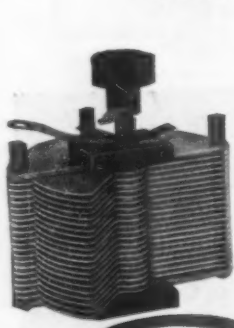
If Fig. 1, it is desired to use detector simply push receiver plug in jack M and first bulb will light. If first stage of amplification is desired place plug in jack N, when both detector and first step amplifier bulbs will light and the station will operate with one step amplifier. Similarly for added stages of amplification.



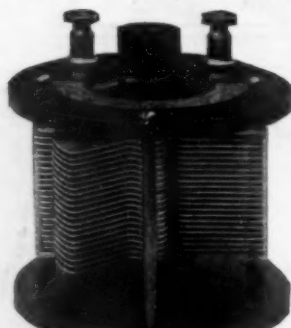
Filament Control Jacks.

The three points on the left (assuming the jack to be in a vertical position with the connections on the bottom.) are (Continued on Page 120)

## "ILLINOIS" THE RELIABLE MADE RIGHT - STAYS RIGHT



STYLE No. 1.

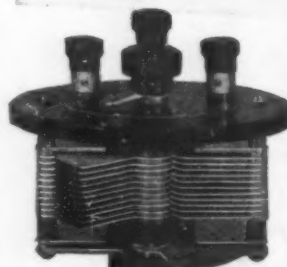


STYLE No. 2.

Three Styles; No. 1, Panel; No. 2, Open Type as shown; No. 3, Fully Encased. Anti Profiteer. Less than pre-war prices. Fully assembled and tested.

	Style No.1	No.2	No.3
67 Plates,	\$7.00	\$8.00	\$8.50
43 "	3.50	4.50	4.75
23 "	2.75	3.75	4.00
13 "	2.25	3.25	3.50

Money back if not satisfied. Just return condenser within 10 days by insured Parcel Post.



VERNIER

With Style No. 1, we will, if desired, furnish 3-inch Metal Dial with large Knob, instead of Scale and Pointer. Extra Price 75 cents. Or we will, if desired, supply the Condenser with smooth 3-16 inch center staff, without Scale, Knob and Pointer, at 15 cents off the list to those who prefer to supply their own dial. Vernier with single movable plate applied to 13, 23 or 43 plate condenser, \$3.00 extra.

We allow no discounts except 5 per cent on orders of 6 or more.

Sent Prepaid on Receipt of Price

Except: Pacific States, Alaska, Hawaii, Philippines and Canal Zone add 10c. Canada add 25c.

Foreign Orders other than Canada not solicited.

G. F. JOHNSON, 625 Black Ave.

Springfield, Illinois

### The Biggest Radio Offer You Ever Heard of!

By special mutual arrangement between the publishers, the three big radio magazines of the country are made available for a limited time at a special rate when ordered together—

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"Q S T," devoted wholly to amateur communication, and the official organ of the A. R. R. L.;

"Radio News," the newsiest and best illustrated radio periodical in the world.

All for  
For  
One Year

**\$5.00**

Don't miss this opportunity to secure the best contemporary radio literature of America coming to your door every month for a year—at a saving in real money, too. Send in your subscription today!

## Pacific Radio News

151 Minna St., San Francisco, Cal.



# KENOTRON RECTIFICATION FOR C.W. TUBE TRANSMISSION



KENOTRON  
UV-216  
20-Watt Output  
PRICE \$7.50

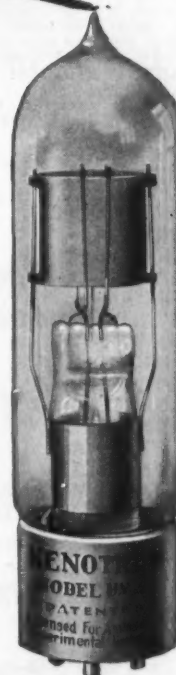
THE least expensive and the most satisfactory method of obtaining a direct-current source for plate-excitation is the use of A. C. with Rectifier Valves.

Two types are available for use with Radiotrons.

**Kenotron Model UV-216** is especially designed to operate with Radiotron UV-202, the 5-watt-transmitting tube. Filament requires 7.5 volts at 2.35 amperes. The A. C. input is 550 volts. The output of this rectifier tube is 20-watts at 350 volts D. C.

**Kenotron Model UV-217** is designed to operate with Radiotron UV-203, the 50-watt tube. The Filament requires 10 volts at 6.5 amperes. The A. C. input is 1250 volts. The output of this rectifier tube is 150-watts at 1000 volts D. C.

Our Standard Porcelain Socket, Model UR-542 at \$1.00 will fit Kenotron UV-216, while a larger socket of the same type, Model UT-541, price \$2.50, is required for Kenotron UV-217.



KENOTRON  
UV-217  
150-Watt Output  
PRICE \$26.50

The Radio Corporation's tubes are covered by patents dated November 7th, 1905, January 15th, 1907, and February 18th, 1908, as well as by other patents issued and pending. Tubes licensed for amateur and experimental work only. Any other use will constitute an infringement.

Send 25 cents for the new C. W.  
Transmission Book and Catalogue  
of Radio Apparatus.

**Radio**  **Corporation**  
*of America*

Sales Division, Commercial Department, Suite 1804  
233 Broadway, New York City

# UNIVERSAL SORSINC SERVICE

**SORSINC Has Inaugurated a New Era in Citizen Wireless** whereby orders for Amateur Radio Apparatus and parts are filled by men who KNOW every phase of Radio.

Our Branch Managers are the same men who for years have taken care of the installation and service of Commercial Apparatus on approximately 700 vessels.

Each Manager is an ex-Amateur, and you will find him ready to assist you with your Radio problems. That Commercial atmosphere will go far toward giving you a definite purpose and aiding you in your success.

**FOR PROMPT AND ACCURATE SERVICE SEND YOUR ORDERS TO OUR NEAREST BRANCH STORE AND SAVE FROM ONE TO TWO WEEKS IN DELIVERY.**

We are catering to you through the mediums of EXPERT RADIO MEN, and NATIONAL and INTERNATIONAL SERVICE.

## APPARATUS IN STOCK:

DEFOREST  
GREBE  
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GENERAL  
CHELSEA  
BUNNELL  
ADAMS-MORGAN  
ROLLER-SMITH  
DUBILIER  
BALDWIN  
PACENT  
CLAPP-EASTHAM  
BRANDES  
REMLER

## RECOMMENDATIONS

No. 20 Paragon Socket, condensite	.....	\$ 1.00
No. 303 R-S Antenna Ammeter 0-2½	.....	5.75
No. UM 530 Antenna Ammeter RCA 0-2½	.....	6.00
No. UM 533 Antenna Ammeter RCA 0-5	.....	6.25
No. UV 712 Amplifying Transformer RCA	.....	7.00
No. 120A Fada Rheostat	.....	1.25
No. F-500 DeForest Rheostat	.....	1.65
No. PR 535 Rheostat for CW RCA	.....	3.00
No. PR 536 A—Battery Potentiometer RCA	.....	2.00
No. 21A Saco Clad Ampl. Trans.	.....	5.00
Type C Baldwin Phones	.....	13.75
Type E Baldwin Phones	.....	15.00
Type F Baldwin Phones	.....	16.25
No. UC 567 Tubular Condenser .00025 RCA	.....	1.20
No. UC 568 Tubular Condenser .0005 RCA	.....	1.35
No. UC 569 Tubular Condenser .001 RCA	.....	1.50
No. UC 570 Tubular Condenser .0025 RCA	.....	2.00



And When You Need a  
B Battery Try A  
SORSINC

6400 Milliampere Hours  
Extra Long Life  
For Reception  
For Transmission  
"The Largest B-  
known"  
\$4.00

THE NEW RADIO CORPORATION CATALOG AND C. W. INSTRUCTIONS mailed to you for 25 cents. Enclose 4 cents additional to cover mailing. A real course.

**DEALERS**—We are Jobbing all the important lines. Write to our nearest Office for our Proposition.

## SHIP OWNERS RADIO SERVICE, Inc.

80 WASHINGTON STREET

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SAVANNAH, 230 Broughton St., East.  
NEW ORLEANS, 710 Maison Blanche Annex.  
PORTLAND, ORE., 622 Worcester Bldg.  
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SAN PEDRO, 432 Palos Verdes St.  
SAN FRANCISCO, 24 California St.  
SEATTLE, 3451 East Marginal Way.  
LONDON, 15 City Chambers, 65 Fenchurch St., E.C.

## FILAMENT CONTROL JACKS

(Continued on Page 118)

used for the filament. The negative pole of the "A" battery on the three stage amplifier is connected to the four jacks at the farthest point on the left. When the plug is out this point is disconnected. The second point from the left in all jacks, except the last, is connected to the rheostat. The third point from the left merely serves to carry the positive connection along to the next bulb.

When the plug is inserted for use of the detector the "A" battery circuit is closed, the phones are placed in the plate circuit and the connection to the amplifying transformer broken. When the plug is removed from jack M the plate circuit is made to include the primary of the amplifying transformer the bulb circuit is broken and the positive pole connection is carried on the successive tubes.

When the plug is inserted in jack N the bulb circuit is closed, lighting both the detector and amplifier bulbs; the primary of the amplifying transformer for the next stage is disconnected and the receiver connections made in its place. This process continues throughout the stages of amplification until the last, when of course there is no occasion to put the phones in the place of the primary of the next amplifying transformer. Hence two points of the jack are removed and in this case the low voltage circuit is closed and phones placed in the plate circuit when the plug is inserted.

## 6ZR IS MANAGER OF MEYBERG STORE IN LOS ANGELES

Hall Berringer, formerly 6ZR of Burlingame, Cal., has been appointed manager of the new Leo J. Meyberg store in Los Angeles. He will shortly be back on the air with his TNT spark.

## To all SUNKIST RADI-O-ITES

Finding that the express charges on the heavier goods from the East are so high as to eat up the profits, I withdraw my offer to deliver in California free of transportation charges.

Paul F. Johnson,  
ALTADENA RADIO LABORATORY,  
Altadena, California.

## NICKEL PLATING

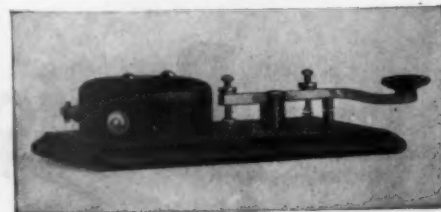
Done right.  
Priced right.

Send us your parts today we will ship tomorrow. All kinds of radio and electrical parts made to order at reasonable prices. Special parts given special attention.

## A. & S. SPECIALTY CO.

818 S. Ave., Wilkinsburg, Pa.

## LEARNERS SETS

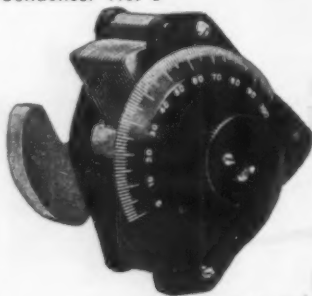


With code, instructions, lever key (all brass) and the AJAX BUZZER \$1.80. Sending keys bakelite base, lever type, all machined brass, \$1.50. Unmounted \$1.00.

60c—AJAX HYTONE BUZZERS—60c external tone adjustments. All postpaid. AJAX ELECTRIC CO., 8 Palmer St., Cambridge, 38, Mass.

## CHELSEA Variable Condensers

Condenser No. 3



### (Die-Cast Type)

No.	Capacity	Type	Size	Lbs.	Price
2	.0011 m. f.	Mounted	4½x4½x3¼	1¾	\$5.00
2	.0006 m. f.	Mounted	4½x4½x2¾	1¾	4.50
3	.0011 m. f.	With Dial	4½x3x4	2	4.75
3	.0011 m. f.	Without Dial	4½x3x4	2	4.35
4	.0006 m. f.	With Dial	4½x3x3½	1¾	4.25
4	.0006 m. f.	Without Dial	4½x3x3½	1¾	3.85

Top, bottom and knob are genuine bakelite, shaft of steel running in bronze bearings, adjustable tension on movable plates, large bakelite dial reading in hundredths, high capacity, amply separated and accurately spaced plates. Unmounted types will fit any panel and are equipped with counterweight.

Purchase from your dealer; if he does not carry it, send to us.  
Bulletin upon request.

## CHELSEA RADIO COMPANY

13 FIFTH STREET CHELSEA, MASS.  
Manufacturers of Radio Apparatus and Moulders of Bakelite



## The Power Ratings of Magnavox Radio Loud Speakers

MAGNAVOX ELECTRODYNAMIC RECEIVERS ARE LIMITED ONLY BY THEIR CONSTRUCTION AND ELECTRICAL CONSTANTS IN THE AMOUNT OF POWER THEY WILL CONVERT INTO SOUND. THEREFORE WE HAVE RATED THEM ACCORDING TO THE INPUT THEY CAN RECEIVE AND SUCCESSFULLY TURN INTO SOUND—EITHER FROM SIGNALS OR FROM RADIO TELEPHONE SPEECH OR MUSIC.

**The Type R-3 Radio Magnavox is a 5 Watt Instrument at \$45**  
**The Type R-2 Radio Telemegafone is a 20 Watt Instrument at \$110**

This also means that with their rated input the Type R-3 may be heard 1 mile under good conditions, and the Type R-2 be heard 3 miles under the same conditions.

The way to get a **Power** input to utilize the enormous converting characteristics of Magnavox is to use from 100 to 500 volts on the plate of your two-stage amplifier—then you will hear your signals with a strength not approached by any other type.

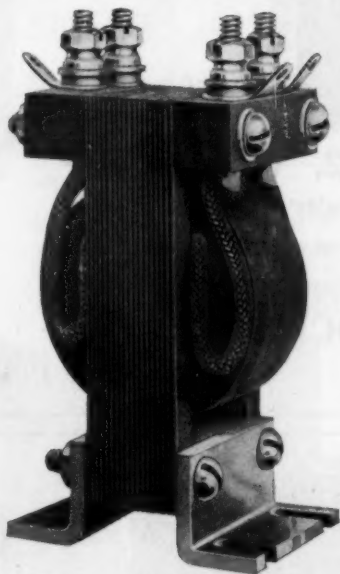
**CAUTION:** Do not use 4 or more stages of amplification, use only two or three with high plate voltage and be careful that you do not put your phones or loudspeakers made from phones in the output circuit, for you will surely burn them out. You need have no fear of even 750 volts for the Magnavox, as they will carry it successfully.

### THE MAGNAVOX COMPANY

OAKLAND, CALIFORNIA

New York Office: Penn-Terminal Bldg., 370 7th Ave., New York City

## Federal Standard Radio Accessories



No. 226-W—Type A  
Audio Frequency Transformer

### ANNOUNCING

**A Material Price Reduction  
on the Famous Federal  
Amplifying Transformer  
Reduced Price \$7.00**

**Federal 226-W Transformer will give Maximum Amplification  
with all types of Standard Tubes on the market**

*Write for Bulletin 102-WB and C Circular  
describing New C-W Accessories*

**Ask Your Dealer for Federal Products. If he does not have them, tell us his name**

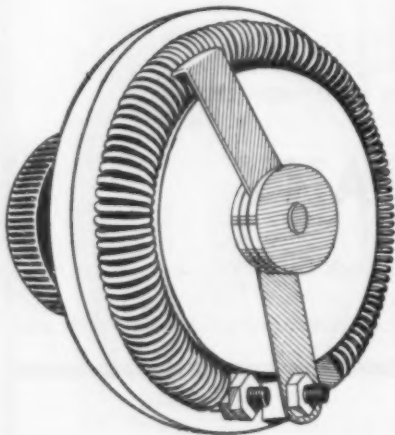
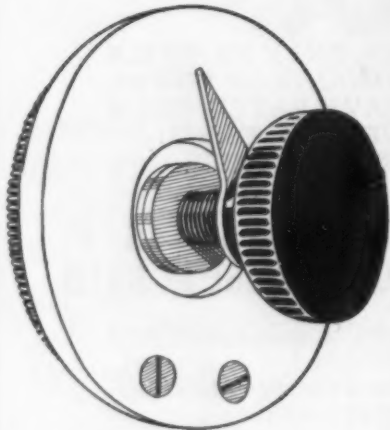
**Federal Telephone & Telegraph Company**

**BUFFALO, NEW YORK, U. S. A.**

**MANUFACTURERS OF STANDARD RADIO ACCESSORIES**

When writing to Advertisers Please mention Pacific Radio News

# SHRAMCO -- REO --



## For your power tube--

New type Shramco Reo, No. 90P.  
1.5 ohm Nichrome resistance.  
Current capacity 6 amperes.  
Price \$2.00, 1 lb. postage.

BACK MOUNTED panel rheostat, specially designed for the Radiotron U.V. 202 and other transmitting tubes. Resistance element (1.5 ohm) is "Nichrome" wire, mounted on a solid block of asbestos. Allows unusually accurate and delicate variation of the filament current. All metal parts brass. Spring phosphor bronze blade. Base 3 in. Overall height 2 1/4 in. Handsomely finished and accompanied by an unconditional guarantee of complete satisfaction. Get the most out of your expensive power tube by using a good rheostat. Order a Shramco Reo today! Now ready for immediate shipment.

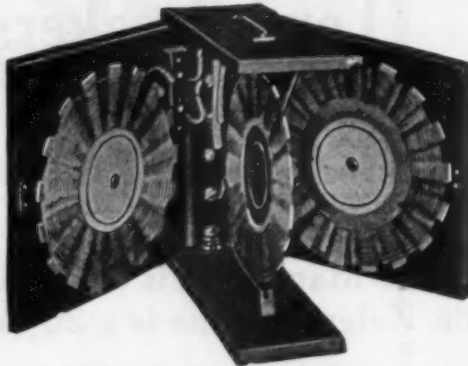
For your vt. Detector and amplifier, use the original Shramco Reo, type 90. "Nichrome" resistance of 6 ohms. Price \$2.00 plus postage for 1 lb. We also make the "Midget" Shramco Reo, 5 ohms resistance, 2 1/2 in. base.

## SHOTTON RADIO MFG. COMPANY

P. O. BOX 3, SCRANTON, PA.

Catalogue "K," listing a complete line of high grade parts at reasonable prices, sent to any reader of Pacific Radio News for five cents in stamps.

# SPIDER WEBS



Cut Shows Front Panel Removed

Exclusive Westinghouse Agents for our Territory

WONDERFUL  
REGENERATIVE  
SIGNALS

NO MAGNETIC  
LEAKAGE

**\$5.50**  
Plus 30c  
Postage

## HERROLD LABORATORIES

"Everything for the Amateur"

467 SO. FIRST STREET

SAN JOSE, CALIF.

**\$4.00** LOOK **\$4.00**



## The New Type J. J. N. 2, Variocoupler

12 Taps on Primary; Units and Fives

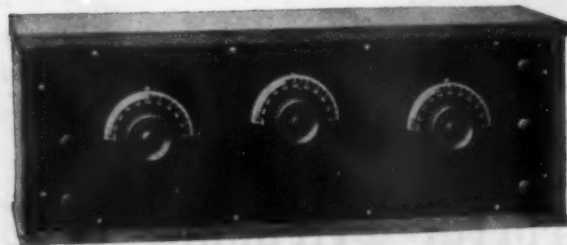
Is easy to mount. The best at a low price

Send Stamp for Catalogue P 21

## DAVID KILLOCH CO.

57 Murray Street

New York City



THIS SHORT WAVE REGENERATIVE RECEIVER, WHICH WE SELL FOR \$30.00 will do the work of others that sell for \$50 to \$85. High-grade and without a peer. Send NOW for circular.

## THE RADIOMART COMPANY

LONG BEACH, CAL.





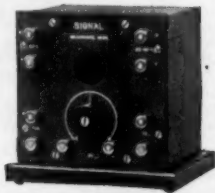
## This Name on Wireless Apparatus Spells "Highest Efficiency"

SIGNAL RADIO APPARATUS pleases the amateur because it is built to the exacting requirements of the professional radio-electrician. And everybody knows "the man in the business" KNOWS WHAT HE WANTS! THE SIGNAL LINE OF INSTRUMENTS is one of the oldest—and most complete; make sure by specifying "SIGNAL."

### R-80 V. T. Control Cabinet

This is the first V. T. control unit on the market that is wired throughout in accordance with fundamental principles, and that has all binding posts marked correctly, as to use and polarity, so that the experimenter may make use of any circuit he chooses, and get maximum efficiency, as well as accuracy and ease of control.

We use our new V. T. socket in this instrument, which will take any of the standard four-prong tubes on the market either detectors or oscillators.

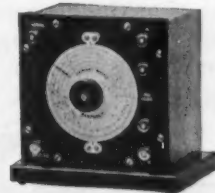
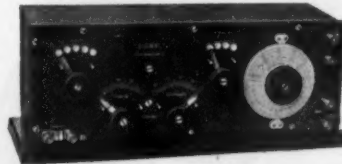


### R-37 Short-Wave Tuner

This instrument is the most efficient, short-wave tuner on the market, being designed on scientifically correct principles.

We use special H. C. coils, with taps at the proper points for controlling the wave-length range, and a small condenser with just enough capacity to cover the steps of inductance. This combination is free from the inherent defects of tuners using either inductance, alone for tuning, or capacity alone, and the results obtained with this tuner, as well as its ease of control, are remarkable.

There is more "Radio" value in "Signal" apparatus, than any so far produced for the money.



### R-44 Primary Series Condenser

For the best results, and real satisfaction in C. W. work, use our special condensers with our new dial, equipped with wave-length scale, so that your set may be calibrated with your own and aerial and ground system.

This allows close and accurate tuning, as well as the duplication of your settings, and makes your receiver serve as a wave-meter.

No other apparatus on the market has this feature to offer.

You should have the *Signal Wireless* catalog. Write for it today; it's free. Address

**Signal Electric Manufacturing Company**  
MENOMINEE, MICHIGAN

## FORMICA

### SHEETS - TUBES - RODS

#### Made from Anhydrous Redmanol Resins

Formica is a homogeneous waterproof insulation with exceptionally high dielectric properties. It is readily machined and does not warp or shrink.

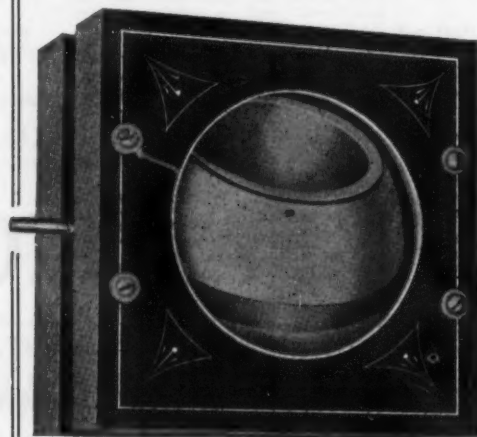
Formica is the ideal material for panels and other insulation parts of Radio Apparatus, on account of its superior electrical and mechanical properties, as well as its splendid appearance.

#### THE FORMICA INSULATION CO.

Cincinnati, Ohio



Pacific Coast Representatives:  
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**Demand  
the  
Best!**

Our products  
are unex-  
celled in  
quality and  
very low in  
price.

### VARIOMETERS

You can't go wrong when you buy our Variometers, because they are recognized to be perfect in every respect. Well made, strongly constructed, and perfectly balanced.

\$4.50 Postage 25c  
Guaranteed Fully

### VARIOCOUPERS

Our Couplers are the kind that can be easily mounted, easily wired and they run as true as a die. Nothing but the best material used throughout.

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Very Selective

These instruments regularly sell for \$5.50 and \$4.50. They are specially priced for a limited time. All orders must show that they were mailed by October 10th.

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Apparatus

Dial-Rheostats ... \$1.75  
Break-in Keys ... \$9.75  
Amplifying Trans. \$3.75

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Our Next  
Month's Ad.

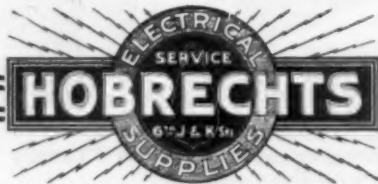
**WESTERN WIRELESS WORKS**  
5534 Edgerly St. Oakland California

## —Standard, up-to-the-minute RADIO Material—COMPLETE Line

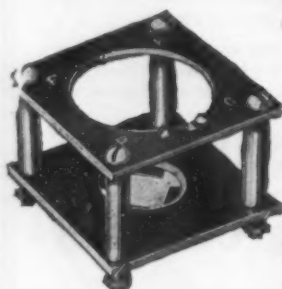
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Regenerative Sets,  
Audion Bulbs for every purpose,  
Special Antenna Wire,  
Insulators, Dials, Variometers,  
Condensers of every kind,  
Radio Magnavox, Amplifiers and Parts.

1014 Sixth



Sacramento



Type 126, Tube Socket

Price **75c** Postpaid

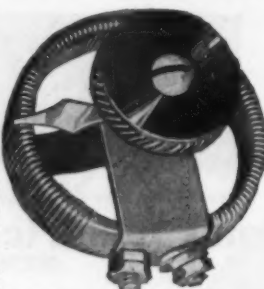
### Something New

Made to Please You and  
Priced to please your  
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By departing from conventional design in audion sockets we have combined the advantages of all, the disadvantages of none and a price lower than any. Think of it—a sturdy easily mounted socket that is heat proof, has bakelite-dilecto insulation, handy binding posts, etc., all for 75c.

And here's a smooth running rheostat that takes panel space 2 inches in diameter, needs one hole to mount, has six ohm resistance, all off and all on positions and a brass panel bushing. Priced at 90c.

**The Wilcox Laboratories**  
LANSING, DEPT. J., MICHIGAN



Type 122 Rheostat

Price **90c** Postpaid

# SATISFACTION!



That's what the STANDARD VT BATTERY is built to give. But to get it you must insist on the genuine STANDARD VT BATTERY, without modification of the name. Refuse and return the substitute.

Type	List Price
No. 7623—Small size	\$1.50
No. 7625—Large size	2.65
No. 7650—Large size Bulb—Variable	3.50

Does Your Dealer Sell the Real Standard VT Battery?

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NEW YORK, N. Y.

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ADVERTISEMENTS IN THIS SECTION ARE THREE CENTS PER WORD NET. REMITTANCE, IN FORM OF CURRENCY, MONEY ORDER OR STAMPS, MUST ACCOMPANY ORDER.

RADIO CABINETS—Mahogany or oak finished or unfinished, to your design. Send rough sketch for quotation. Prompt service Formica cut to size. Radio supplies, parts, etc. Pacific Radio Exchange, 439 Call Bldg., San Francisco, Calif.

ONE KW TRANSMITTER complete for sale; also several head sets, etc. TRUMBULL, 365 McGraw, Seattle.

WE HAVE—Firco apparatus, Baldys, Sacclads, etc. Chi-Rad variometers knockdown \$4, set up \$5. Get our little set. Variometer, wavemeter, receiver, and only \$9 with Crystal detector, \$10. Always in use. Murdock's type 56s. Write! Port Arthur Radio Laboratory, 2048 Fifth St., Port Arthur, Texas.

FOLLOWING FOR SALE: Complete station. 600-foot aerial, pole, 1-4 KW transmitter. Receiver and Brandes Transatlantics. Also 6-volt, 40-amp Exide Battery, Blitzen 43-plate variable; 2 old type Audiotrons. \$60.00 cash. (Buyer pays express or extra charges). G. R. Mackin, 88 Peralta Ave., San Francisco, Cal.

STOP! LOOK! AND ACT! V. T.'s. With each Radiotron UV200 V. T. detector or A-P Moorhead V. T. detector or Radiotron U. V. 201 V. T. Amp. or A-P Moorhead V. T. amp., we will supply free of charge your choice of either a Murdock V. T. socket, improved contact type, or a Remler Bakelite smooth running rheostat, latest type. Radiotron UV200, \$5. Radiotron Amp. V. T. UV 201, \$6.50; Moorhead A-P detector \$5.00; Moorhead A-P Amp. V. T., \$6.50; Remler Bakelite rheostat, latest type, \$1; Murdock V. T. socket, \$1. We absolutely guarantee the foregoing apparatus. Only new and high grade equipment carried in stock. All orders are filled within twelve hours and shipped postpaid and insured, thereby saving time and money. Remember us. The Kehler Radio Laboratories, Dept. F, Abilene, Kansas.

DUBILIER CONDENSER. Practically new. 14,000 volts. .007 mfd. \$22.00. L. E. Martin, 100 Olive Ave., Fresno, Cal.

SHORT WAVE REGENERATIVE SET. Has two Radio Shop Variometer, Wireless Shop Var.-Condenser, oak cabinet, dark finish; heavy Bakelite panel, Remler dials; special circuit. All tuning done on variable condenser. Highly efficient. Fully guaranteed. \$25.00. Box 100, Pacific Radio News, 151 Minna St., San Francisco, Cal.

FOR THE LOVE OF MIKE, read this list of bargains in used radio apparatus that we have for sale this month:

One Short Wave Regenerative Receiver, used only two months. In first class condition. Worth \$50, sell for \$25. Postage on 11 pounds extra.

One Murdock Variable Condenser. Regular price \$5. Sell for \$3. Postage 25c extra.

One Murdock Oscillation Transformer. Regular price \$5. Sell for \$3. Postage 25c.

One A.C. Ammeter, zero to 5 scale. Regular price \$5. Sell for \$4. Postage 25c, including insurance.

One 1-stage Amplifier, complete with bakelite panel, tube socket, amplifying transformer, binding posts, rheostats and wiring. Ready for use. Shop worn only slightly. Sell for \$10. Postage 25c.

One Audion Control Panel. Bakelite panel, 8 binding posts, Murdock VT socket, Remler Grid Condenser, Remler Rheostat. Regular price \$10. Sell for \$6.50, prepaid.

Besides this list of slightly used apparatus we have several two and three-stage amplifiers. A dandy two-step and detector for \$35, in beautiful oak cabinet, bakelite panel, complete in every detail, without tubes or batteries. One Honeycomb receiver with set of six coils. Good for Pacific Coast radio telephone concerts. This receiver has two variable condensers, oak cabinet, bakelite panel, series-parallel condenser switch, all binding posts and wiring. Sell to first person who sends \$40 money order.

One C. R. 1 Grebe set complete with V. T. tube and Edison "A" battery. \$70.

Get on our mailing list at once to receive regular monthly circular of second hand supplies. Everything guaranteed to be in first class operating condition. No junk. Western Wireless Works, Used Apparatus Department, 5534 Edgerly St., Oakland, Calif.



## Is there a Crepe On Your Vacuum Tube?



Your last vacuum tube would still be "alive" and the money you paid for a new one would be in your pocket if its filament had been protected with a

### RADECO SAFETY FUSE

(Patent pending)

Because of the insignificant cost, and absolute protection against high amperage, RADECO Safety Fuses are now a standard part of every efficient wireless set.

NOW, while your tube is in perfect condition, pin one dollar to this advertisement and be guarded against all future vacuum tube expense.

We carry complete stock of all radio apparatus. Order from any standard catalog.

### Radio Equipment Co.

630 WASHINGTON STREET,  
Boston, Mass.

#### New Price

RADECO Safety Fuses come in 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2 and 3 amp. sizes. Slip directly on filament terminals of any standard bulb used in any standard socket. Sent Postpaid.

Four for

**\$1.00**

—All That It's Name Implies—  
We've changed our name—

# RADIO

We've broadened our scope—  
We've increased everything—  
—Except the price.

## RADIOPHONE "Interpanel System"

REG. U.S. PAT. OFF.

### Is the Last Word in Wireless



No discarded apparatus.  
To increase the range add a panel.

No system of wireless even approaches it in efficiency and low cost. It was invented by Dr. DeForest, and is built under the keen, watchful eye of the inventor.

The "Interpanel" is a long step forward in radio systems. It is the application of the unit idea of sectional bookcases. Unlike other systems it embodies the transmitter as well as the receiver. All you have to do in order to lengthen your range is to add a unit or "panel" without discarding a single piece of apparatus.

The DeForest "Interpanel" Radiophone is for CW transmission of both telephone and telegraph—the only up-to-date method of radio transmission.

There can be only one best—and the best is always the cheapest, particularly in radio apparatus. There is only one "Interpanel."

#### FOUR PANEL STATION

Complete set of four units, mounted horizontally

- (1) Complete radio "Midget" transmitter. Phone sending range 30 miles (OT-3).
- (2) Complete short wave tuner, 150 to 600 meters (MT-100).
- (3) Complete audion control, especially for gaseous tubes (MP-100).
- (4) Complete one-step amplifier (MP-200).
- (5) Any additional step of amplification may be added.

Write for catalog. Address Dept. 108A.

### DeForest Radio Tel. & Tel. Co.

Manufacturers of Highest Grade Radio Apparatus

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Pacific Coast Distributors:

Henry M. Shaw, Pacific Radio Supplies Co., 638 Mission Street,  
San Francisco, Cal.

*If It's a Radiophone, It's a DeForest Invention*

## A MULE Could not kick a msg. a 100 miles with all its KICKS

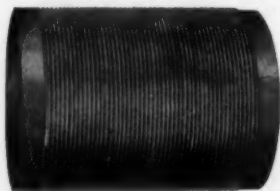
But—10 Watts of CW easily  
sends it 10 times that

### F A R

FOR RESULTS, EFFICIENCY AND SERVICE USE

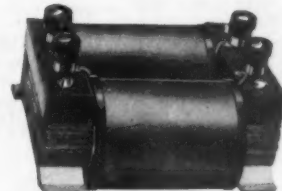
## < STANRAD >

### APPARATUS



C. W. Inductance  
Type SR-7

Single or two coil winding ..... \$5.00  
Threaded Formica Tube  
only ..... 3.75



C. W. Choke Coil  
Type SR-6

150 M.A. .... \$6.00  
500 M.A. .... 7.50

If your dealer can not supply you, send us his name.  
STANDARD RADIO CO., LOS ANGELES, CAL.

# RADIO APPARATUS

*Distributors of Reliable Radio Apparatus to Schools, Colleges, Radio Clubs and Experimenters  
All Over the World!*

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SERVICE FILLS ORDERS

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CORPORATION'S PRODUCT ALL

OVER THE WORLD! TRY

US AND SEE!

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No. UV-712 Radio Corporation	\$7.00
No. P-1 Amrad, mounted	4.50
No. P-2 Amrad, unmounted	3.75
No. QO Clapp-Eastham, semi mounted	4.00

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No. DA Westinghouse, Detector and two stage, in beautiful cabinet	65.00
No. RORH Grebe two step with automatic filament control, a beauty	55.00
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No. P-1 Amrad two stage in 10x5 cabinet, splendid value	32.50

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"Pittsco" 7 strand No. 22 tinned copper, 65 ft. per lb. Per ft.	0.01
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## "B" BATTERIES

No. 7623 Standard, 22.5V small	1.50
No. 7625 Standard, 22.5V large	2.65
No. 7650 Standard, 22.5V variable	3.50
No. 763 Eveready 22.5V small	2.25
No. 766 Eveready variable 16½ to 22½ volts, large	3.00
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No. P-1 Sorsinc, 22.5 Volts, large, and extra long life	4.00

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No. ROCC Grebe .0002MF	1.00
No. ROCD Grebe .0005 MF	1.20

## GRID LEAKS

No. MW-1 Radio Corporation, ½, 1, 1.5, 2, 3 or 5 megohms, each complete	1.25
Grid leaks only	0.75
Bases only	0.50

## HOT WIRE METERS

No. P-1 Roller Smith, 0-2.5 flush mounting. A real value for	4.75
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No. 127 General Radio, .5, 1, 2.5, 5 or 10 amps, flush or front mtg. each	7.75
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## LOUD SPEAKERS

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No. P-2 Vocaloud, station type	30.00
No. P-3 Vocaloud, Laboratory type	25.00

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No. 50 Pacent Universal type	2.00
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No. CR-2 Grebe, 175-680 meters; a special value at	39.95
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No. CR-8 Grebe "Relay Super-special" 150-1000 meters, complete set. Just out!	80.00
No. RA Westinghouse, 180-700 meters, very selective, beautiful cabinet	65.00
No. RC Westinghouse, RA Receiver, and DA Det. Amplifier combined in one cabinet, splendid unit, compact	125.00

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No. UT-541 Radio Corporation for UV-203 tube	2.50
No. 156 General Radio, new price	1.50
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No. P-1 Amrad, new price	0.75

## RECTIFYING DEVICES

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Brandes, Superior, double	8.00
Brandes, Translantic, double	12.00
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Note: All Radiotrons sent postage and insured prepaid anywhere in U. S. A. Send us your orders for Radiotrons!

## RADIOPHONE AND CW. APPARATUS CW. POWER TRANSFORMERS

Acme 50 Watt 350 Volts, mounted	15.00
" 50 " 350V., unmounted	12.00
" 200 " 350-550V., mounted	20.00
" 200 " 350-550V., unmted	15.00
" 500 " 1000-1500V., mtd.	25.00
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Acme double coil, 1.5 Hen. 500 MA.	8.00

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No. 3 Chelsea .0011 MF. unmounted	4.75
No. 366-Int. Murdock, .001 MF. unmounted	4.25

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Acme 75 Watt, mounted	12.00
" 75 " unmounted	9.00
" 150 " mounted	16.00
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No. 21-AA Western Elec. 1000 Volt AC. condenser	2.50

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Model 301 Weston, D. C. flush, 0-100, 0-150, 0-200, 0-300, 0-500 or 0-800 milli-amperes, each	8.50
Model 301 Weston D. C. flush, 0-1, 0-2, 0-3, 0-5, or 0-10 Amperes	8.50
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No. A-3 Acme semi-mtd.	5.00
No. A-3 Acme fully mounted	7.00
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## RHEOSTATS

No. 560 Murdock, moulded, new type for back mounting	1.00
No. 214 General Radio, 2.5 Amp. type, just right for 1UV-202 tube	2.50
No. 132 National Controller, 6.5 Amp. type, just right for 1UV-203 tube	4.50

## RESISTANCES

Type HS Ward Leonard 5000 ohms	2.25
Type HS Ward Leonard 10,000 ohms	3.50

"Let 'PITTSKO' products, super-service and delivery solve your Radio problems"

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Send ten cents in stamps for Catalog No. 22. Over 100 pages, over 150 illustrations, over 600 items.

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## FRENCH INTERNATIONAL RADIO NET

The French government is working out a plan of world-wide wireless communication so as to be independent of all foreign-owned communication systems. From the home station at St. Assize, near Paris, it will be possible to reach all outlying French possessions, including Madagascar, Cochinchina, and French Guiana. The largest direct distance will be 10,000 kilometers, from Paris to Saigon, 9,000 kilos from Paris to Madagascar, 6,000 kilos from Paris to Brazzaville in West Africa. It is expected that automatic transmission and reception will allow a speed of 300 words per minute. The press rate will probably be one cent per word.

### RADIO FUNERAL SERVICE

"Can you oblige me with a copy of the burial service?" This remarkable message was received by the wireless operator on the Cunard liner Carmania from a freight steamer 200 miles away, while the liner was about 300 miles west of Fastnet bound for Liverpool.

The message was despatched from the Canadian Trapper, in which a fireman had died on the voyage from Montreal to London. The wireless operator in the Carmania, which proceeded on her way at full speed, tapped out the service, word by word, in group messages of 150 words.

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From Mine Direct to You  
Brings in all music and signals, loud and clear.

TESTED { GALENA  
CERUSITE  
PYRITE

Box, assorted sizes, of either 50c postpaid. Large box, containing all sizes, \$1.50 postpaid. Large single piece, 25c.

MONEY-BACK GUARANTEE  
Western Distributors

"Million Point Mineral" Co.

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**ABC**

**Catalogue**

A marvelously easy to understand instruction book on most advanced radio methods, because it describes in detail the unusual mechanical and electrical features and simplicity of the complete ABC line.

Sixteen pages, clearly illustrated, in two colors. Every price quoted in this catalog represents a new low level for apparatus of recognized quality.

Send 10c for latest ABC catalog, "Professional Radio Equipment at Amateur Prices." Request Catalog 10.

WIRELESS EQUIPMENT CO., Inc.  
32 Austin Street, Newark, N.J.

# By Popular Request

During the past few months we have received such a large number of requests from our readers to again give free premiums with subscriptions that we have decided to hold a new subscription drive. The apparatus given free to those who subscribe or secure subscriptions makes this new campaign an unusually attractive one. Many new premiums will be awarded. You can't go wrong on this offer as there are no strings attached to it.

## Here Are Our New Propositions:

### Offer "A"

Your choice of any Vacuum Tube on the market, not exceeding \$6.50 in retail price, will be sent to you absolutely free of charge if you send us FOUR subscriptions to "RADIO." 25c must be added for mailing charges.

### Offer "B"

The well known McGuire Radio Lab. Variometer (Cesco Type) or the McGuire Variocoupler will be given free with three subscriptions to "RADIO." These instruments have enjoyed a wide and popular sale. 25c must be added for mailing charges. YOU SAVE \$5.50 ON THIS OFFER.

### Offer "C"

A dandy Audion Control Panel of Bakelite. Has V. T. Socket, Rheostat and Grid Leak. 8 Binding Posts. Given free with five subscriptions to "RADIO." 25c must be added for mailing charges.

### Offer "D"

5 Watt Power Tubes. Any standard make. One of these tubes given free with five subscriptions to "RADIO." These tubes are guaranteed to be absolutely new and standard in every respect. Mailing charges 25c.

### Offer "E"

The new Parkin Dial-Rheostat, priced at \$1.75, sent to you free if you secure two subscriptions to "RADIO." This device is illustrated in our advertising columns. 12c must be added for mailing charges.

### Offer "F"

Any one of the following popular radio books sent to you free if you secure two subscriptions to "RADIO": ARC Radio Manual (\$2.50), Elements of Radio Teleg. (\$2.50), Consolidated Call Book (\$1.50) These books sent postpaid.

### Offer "G"

Polished Bakelite V. T. Socket (\$1.50) given free with one subscription to "RADIO." Mailing charges 12 cents.

### Offer "H"

Bakelite and Mica Grid Condenser given free with one subscription to "RADIO." Standard size for any tube. Mailing charges 10c.

## This Offer Will Be Withdrawn Shortly.

Hustle up those Subscriptions and get some  
Dandy Radio Apparatus FREE!

## Start Right Now!

DON'T WAIT 'TILL  
TOMORROW. YOUR  
FRIENDS MAY BEAT  
YOU TO IT.

PACIFIC RADIO PUB. CO., 151 MINNA ST., SAN FRANCISCO.

Send me AT ONCE the apparatus described in offer.....

I enclose the remittance of \$..... for the subscriptions and .....cents for mailing charges. You will enter the following subscribers to "RADIO" (formerly Pacific Radio News) for a full year each.

Name ..... Address .....

Name ..... Address .....

Name ..... Address .....

Name ..... Address .....

When writing to Advertisers Please mention Pacific Radio News

# BLISS

## Unit Amplifiers and Panels



The most pleasing feature of this Amplifier is its compactness. All the instruments are mounted on the panel, and when mounted in a cabinet the panel is very easily removed, making all parts easily accessible at all times. The Transformers are General Radio make and are designed for the U. V. 202 Radiotron. Tube Sockets are standard, four-prong type. Panel is of well finished XX Bakelite and may be mounted on a base or in a cabinet with other units. Supplied without tubes or batteries. Wiring diagrams accompany each amplifier. AN IDEAL AMPLIFIER.

No. W-609 One stage Amplifier.....	\$15.00	No. W-612 Paragon Rheostat with Bliss Moulded Bakelite Knob .....	\$ 2.00
No. W-610 One stage Amplifier Panel.....	2.25	No. W-613 Insulated Binding Posts.....	.12
No. W-611 Tube Socket Mounted on back of Transformer .....	6.25	No. W-614 Complete set of Parts for W-609 Amplifier without wire and connections and not assembled.....	11.34



No. 301 BLISS Improved Switch, as illustration, Edgewise contact type with a genuine molded Bakelite Knob. 1 3-8 in. in diameter with a radius of 1 3-8 inches. Nickel plated lever.....\$ .60

No. P-501 BLISS Moulded Bakelite Knob. 1 3-8 inches in diameter. POSTAGE PREPAID ..... .30

## R. W. BLISS COMPANY

(Department P.)

42 Davis Street

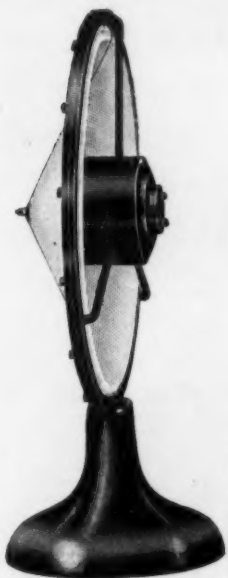
Wollaston, Mass.



# CONTINENTAL NEWS

OCTOBER, 1921

PUBLISHED EVERY MONTH IN PACIFIC RADIO NEWS BY CONTINENTAL RADIO AND ELECTRIC CORPORATION



## The PHONETRON

Electric Sound Converter  
More Than a Loud Speaker!  
Designed for both reception and wireless telephone transmission in place of a microphone transmitter.

Price \$45.00

ALL AMATEURS: Send for FREE descriptive leaflets about Paragon and Phonetron, the improved type of loud speaker. Creco Catalogue, 25 cents.



## Do You Still Own a Quarter?

If so, and if you haven't already sent for the Creco Catalogue, that's the best way to invest it. 112 pages for a quarter, chock full of illustrations, descriptions, prices and all the radio apparatus you ever heard of. Also codes, abbreviations, tables, etc., that you will use daily. Be a sport. Risk a quarter on the best radio buy ever offered you! Anyway, you get credit for quarter on your first \$5.00 order, so you really get the catalogue for nothing. Your copy is all ready to be mailed. Slip your name and your quarter into an envelope now!

## PARAGON Scores Again

The hearty endorsement of Paragon R. A. Ten by leading amateurs speaks for itself. Last month we printed 2ZL8's enthusiastic letter. This month we have selected this similar statement from 2ZM as representing the opinions of hundreds of amateurs who have been astonished and delighted with the results they have secured.

"Wish to acknowledge receipt of my Paragon in good shape.

At the same time, I wish to say that I have gotten some surprising results, having read a number of DX stations that were never heard before, with my other receivers, even in the winter time.

I can truthfully say that the Paragon gives better results for all around amateur work than any receiver I have ever used, and will highly recommend it to my fellow amateurs.

(Signed) L. Spangenberg,  
Radio 2ZM.

## Ask your Radio Dealer

to show you a Paragon R.A. Ten regenerative receiver. If he hasn't one in stock, he will gladly get one if you ask him for it. The seals have now been broken to show you the splendid inside construction. Examine a Paragon carefully—convince yourself that these leading amateurs have not overstated one particle in their complete approval of Paragon results,—and that Paragon is well worth its \$85.00 price.



## CRECO AMPLIFYING TRANSFORMER High in quality— Low in Price: \$3.25

In keeping with the usual Creco policy of distributing only apparatus of recognized quality, we offer an instrument of utmost mechanical and electrical efficiency, complete, ready for mounting, at an unprecedented low price. The Creco transformer was perfected with special reference to the needs of present day VTs. Important features are:

Unequalled audibility and amplification.

No holes in core, eliminating magnetic leakage.

All castings eliminated, etc., etc.

Such a simple, but efficient instrument should interest you at any price. But at the price of only \$3.25 (far lower than any other transformer) you will have to place your order quickly. Send for your Creco Transformers at once,—we cannot guarantee to keep the production up to the demand.

## Honolulu comes to Continental (read this letter)

Today I am sending you a radio again for some wireless supplies.

You are getting me delivery in fifteen days from the day I cable you, and that is some service to the center of the Pacific.

(Signed) CYRIL O. SMITH.  
Permanent address, The Royal School, Honolulu, U. S. A.

Our Service Covers the World

## Order by mail from New York's leading Radio Store

It's a lucky thing for a good many radio stores, that amateurs are willing to blame the mails when they have to wait for their goods. You can order from Continental with the assurance that you won't have to wait. You can bank on it that your order will start toward you the day we get it. Everything listed in our catalogue is right here in stock—no delays. And there isn't much worth having, in radio, that isn't listed in the CRECO catalogue. It's not out of place to say that the Continental mail order stock includes worth while apparatus for every part of your station. No matter what wireless equipment you need, you can be sure that Continental has it, or will get it for you quicker than you could get it yourself.

Send your next order to Continental. No matter how large or small, it will be filled promptly, courteously, carefully. Please make all remittances by bank draft or Post Office Money Order, to avoid any possible delay.

## CONTINENTAL RADIO AND ELECTRIC CORP.

EXCLUSIVE WHOLESALE DISTRIBUTORS FOR  
PHONETRON AND PARAGON R. A. TEN

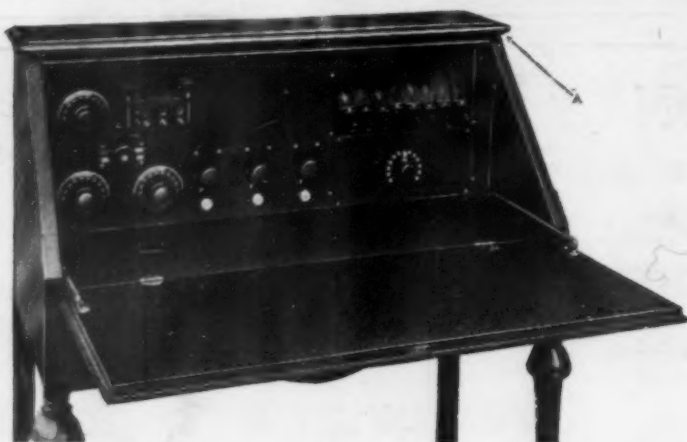
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J. Stantley, Treas.

Dept. G79 Warren St.

New York City

## SPECIAL SETS TO YOUR OWN SPECIFICATIONS



The beautiful walnut desk set illustrated is but a sample of our complete, low-priced "made-to-order" manufacturing service. What can we make for you?

If you can't buy **exactly** what you want ready-made, don't buy ready-made at all. Let us make **precisely** what you want, build it **just** the way you want it, and adapt it to fit your purpose **exactly**,—anything from the smallest part to the most complicated and elaborate set. The cost is low. What can we make for you **right now**? Let us submit a figure—that will cost you nothing, anyway, and we may have some valuable suggestions to offer.

Let our service department help you, too. Tell us your troubles. Even though you have purchased your apparatus elsewhere, this service is always at your disposal. Try it—**now**.

Of course, we also have a splendid stock of standard radio equipment and supplies, good apparatus at low prices, and deliveries—Bing! just like that.



**We are Western Agents for the Radio Corporation of America and have Dealers Rights for New Discounts**

### FORMICA PANELS.

Our price for Formica Panels is 2¼c per square inch. All panels are cut accurately and the edges beveled. Polishing is done for 75c per square foot, and all panels are drilled for \$1 if center punched.

We have a complete stock of nickel plated machine and wood screws, round, oval, and flat, at 2c each. Sizes carried in stock, 4-36, 6-32, 8-32, and 10-32.

## FOR DEALERS ONLY

Due to the increased demand it is getting harder every day to get Radiotron apparatus deliveries on time, and these deliveries will be slower and slower as the season advances.

The Fall rush will undoubtedly find your stock short in this popular line. Guarantee yourself against the loss of profitable sales by stocking a full line of Radiotron apparatus **AT ONCE**.

## AMATEURS

Write for circulars on Radiotron apparatus, and **IF YOUR DEALER CANNOT SUPPLY YOU, WRITE TO US DIRECT.**

# THE RADIO TELEPHONE SHOP

*Pen Brand Products*

## RADIO EQUIPMENT

Designers - - - Contractors

175 Steuart Street  
SAN FRANCISCO, CAL.

*John*



